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Original Articles

PRESIDENT'S ADDRESS

SOUTHERN SOCIETY OF ORTHODONTISTS*

N. F. MUIR, D.D.S., ROANOKE, VA.

AT THIS time it is my privilege to address you, as you have assembled here for the thirteenth meeting of the Southern Society of Orthodontists. This privilege is extended me by virtue of the fact that you have selected me for your presiding officer, an honor which I deeply appreciate.

The Southern Society, which is so idealistic and altruistic in its objectives, was organized by a few thoughtful men who recognized the necessity of social intercourse and cooperative interest among the orthodontists in a rapidly growing section of our country. The noble deeds of these pioneers who conceived the idea and put thought into action have been mentioned many times before, but I should have a feeling of ungratefulness if I failed to express my personal regard for their inspiration and example. Their interest has not waned with the years, and their enthusiasm lights the road of endeavor which we hope to follow. Almost all of them are with us today, and the success of this meeting can be ascribed in a full measure to their influence and effort.

We are always in a receptive mood, eager to draw aside the veil of empiricism and view any bit of knowledge that has been unearthed. Largely because of the work done by some of our progressive members along the lines of biologic and physiologic research and perfecting technical procedure, an increasing number of orthodontists and scientists of allied professions from all over the country have been attracted to our midst. Some of these men have become associate or honorary members of our group, and we are greatly pleased whenever they can attend the meetings.

*Read at a meeting in Hot Springs, Va., July 18, 1934.

It is with sadness that we record the loss of Dr. Martin Dewey, one of our honorary members, who died in May, 1933. The place left by Dr. Dewey in both the dental and the orthodontic world will be hard to fill. He will long be remembered by the Southern Society whose meetings he attended for years and to which he gave freely of his time and talents.

It has been about a year and a half since this organization held its last meeting. The general economic condition of the country was responsible for postponing the last meeting of the American Society of Orthodontists, thus necessitating a postponement of our meeting. Although the change caused some confusion at the time, it has proved in the end to be a happy solution, for this is a very desirable time to meet here.

Almost all of us attend each year the meetings of our district and state associations, our sectional orthodontic societies and the American Society of Orthodontists. Besides these, we may attend meetings of other sectional societies as well as the meetings of the American Dental Association. It has been suggested that if all the sectional societies could arrange to meet one year and the American Society of Orthodontists meet the next year and continue in this way, meeting biennially in alternate years, we should be relieved of the great expense of attending so many meetings. This is but one phase of a proposal which will be presented to you later through other channels. The sectional societies will be asked to consider the advisability of becoming components of the American Society of Orthodontists.

If the component plan can be worked out on a cooperative and amicable basis, it would certainly be desirable from an economic standpoint. On the other hand, I would oppose anything that would jeopardize the integrity and freedom of the Southern Society. It has grown to be a very potent institution for the presentation and discussion of orthodontic problems and nothing should be permitted to change its course.

From the time of our last meeting we have experienced unusual conditions. In both our social and professional activities we have been introduced to novel methods and changed procedures. The New Deal has accentuated the already growing idea of services for the masses, of state dentistry or some similar alternative. Surveys have been made exposing the number of children in need of dental attention, and through the Federal Emergency Relief Administration the government intends to help the great army of indigents. According to advertisements, the laboratories are diagnosing dental anomalies by model and treating the cases by mail. Since collective action rather than individualism seems to be the order of the day, we should give serious and constructive thought to the solution of these vital problems with which we are confronted. In unity there is strength; therefore, the more completely we are organized, the more effectively we can promote desirable enterprises and eliminate things that are not for the common good.

A biographer of famous English writers once said that we are prone to magnify the virtues of our heroes. Likewise in the field of orthodontia we may find ourselves attached to some pet theory or method of practice which may become an obsession and exclude from our minds all that is new and progres-

sive. Emerson warns us against such a course when he says: "A foolish consistency is the hobgoblin of little minds. Speak what you think now in hard words and tomorrow speak what tomorrow thinks in hard words again, though it contradict everything you said today. There will be an agreement in whatsoever variety of actions so they be honest and natural in their hour."

In recent years it seems that almost all our accepted theories and principles have been either refuted or challenged. We believe that a knowledge of etiology is necessary for a proper diagnosis and treatment of our cases. In years past almost every so-called inherited cause or factor was discredited by an argument favoring some influence of environment. Today there are very few local causes that are given credence. In fact, some of our most conscientious authorities are unable to ascribe any definite causes for malocclusion. Orthodontic experience offers many inferences, and from our observation we recognize contributing factors, however inconstant they may be.

Our field of operation is an integral part of the whole body, and since our problem is one of growth and development, we must realize that findings in the dental field are interdependent upon conditions existing within the entire organism. It has been demonstrated that growth periods and tissue variations of one part are correlated to similar conditions in other parts of the individual. The influence exerted by the hormones, that of the calcium-phosphorus metabolism, and that of the vitamin potency all have a profound effect upon bone formation and development. A clearer understanding of their application will help solve some of our problems. Every day we realize the necessity for a closer contact with the internist, the endocrinologist, and the pediatrician. They should be able to help us from the standpoint of both diagnosis and treatment.

At our last meeting we were reminded of the unscientific or unproved concepts of orthodontia as they existed and were advised to look in the direction of heredity to find a solution of our problem. At this meeting we are going to follow up many of the investigations which were unfinished at the last session and try to elucidate some of the mysteries with which we are confronted in our work. A perusal of the printed program reveals the splendid array of papers, case reports, and clinics to be presented. The majority of essayists and clinicians are from outside our society, some of them traveling quite a distance and contributing generously of their time and knowledge for our enlightenment. On behalf of the Society I want to thank them, for we owe them an enormous debt of gratitude. To those members of the Society who have contributed to the program we are also grateful.

To the members of the program committee, Oren A. Oliver, Clinton C. Howard and W. A. Clarke, I wish to express my deepest appreciation. The entire credit for selecting the material and arranging the program belongs to them.

I wish to thank the committee on ladies' entertainment for their splendid program, also H. C. Shotwell for his efforts in securing many handsome golf prizes. The donors of these prizes should receive our recognition.

I want to thank our secretary, Wm. P. Wood, Jr., for the very efficient manner in which he has performed the duties of his office.

To the members and guests who have come to this meeting, I am especially grateful. This is the first time the Southern Society of Orthodontists has met in Virginia, and I am exceedingly proud, along with my confreres in this state, to have the honor of being your host. It is my sincere hope that your sojourn here will be a happy one and that when you depart it will be with a feeling of benefit and satisfaction.

THE CONDUCT OF AN ORTHODONTIC PRACTICE*

CHARLES R. BAKER, D.D.S., F.A.C.D., EVANSTON, ILL.

MY PRESENT ideas on the subject of the conduct of an orthodontic practice have been developed during twenty-five years of exclusive practice of orthodontia, preceded by five years as instructor in an orthodontia clinic. During this period many changes have occurred in the rapid development of orthodontia. I have used many plans of treatment, numerous types of appliances, and have made many changes in my methods of operating, of keeping records, and of dealing with patients.

It is obvious that the first requirement of an orthodontist is that he be qualified, by proper preparation in the matter of study and clinical experience, to practice orthodontia. He should also have a natural and altruistic interest in doing something of lasting value in improving the health and happiness of children.

While many different plans of orthodontic education and preparation have been used during the last thirty years, most of which consisted of short postgraduate courses of a few weeks, I believe that the best plan available at this time is a graduate course of at least one year in a dental school, under capable instruction. An added advantage is to take the course half time for two years in order to obtain longer clinical experience. If the orthodontist is then fortunate enough to be able to continue at the school in the capacity of an instructor in the orthodontia clinic for a number of years longer, he not only will be able to add to his knowledge and experience, but also will have a college connection which should add to his importance in the public mind. The most valuable feature of this teaching position in the dental school, however, is the fact that he is in close contact with the students, many of whom will be in a position to send patients to him after they are graduated and have offices of their own.

A certificate of qualification from the American Board of Orthodontia is a valuable asset, and the younger orthodontists should apply for one as soon as they feel that they are qualified to meet the requirements of the Board successfully.

The most valuable asset of an orthodontist is the confidence of the general practitioners in his community, for his success in practice will depend to a great extent upon their recommendation and endorsement. Satisfied patients are another essential requirement for the development of a successful practice.

The selection of a location for the practice of orthodontia is an important matter. Primarily, such a location must be in a community from which the

*Read before the Southern Society of Orthodontists, Hot Springs, Va., July 18, 1934.

orthodontist may reasonably expect to build up a practice sufficient to occupy his time. In large cities some men have an office in a central downtown location, while others prefer an outlying location or the suburbs. In the case of a suburban office, the community should be of sufficient size to support a practice, for it would not seem logical to expect many patients from other sections of a large city to travel out to a surburban office. Some orthodontists main-

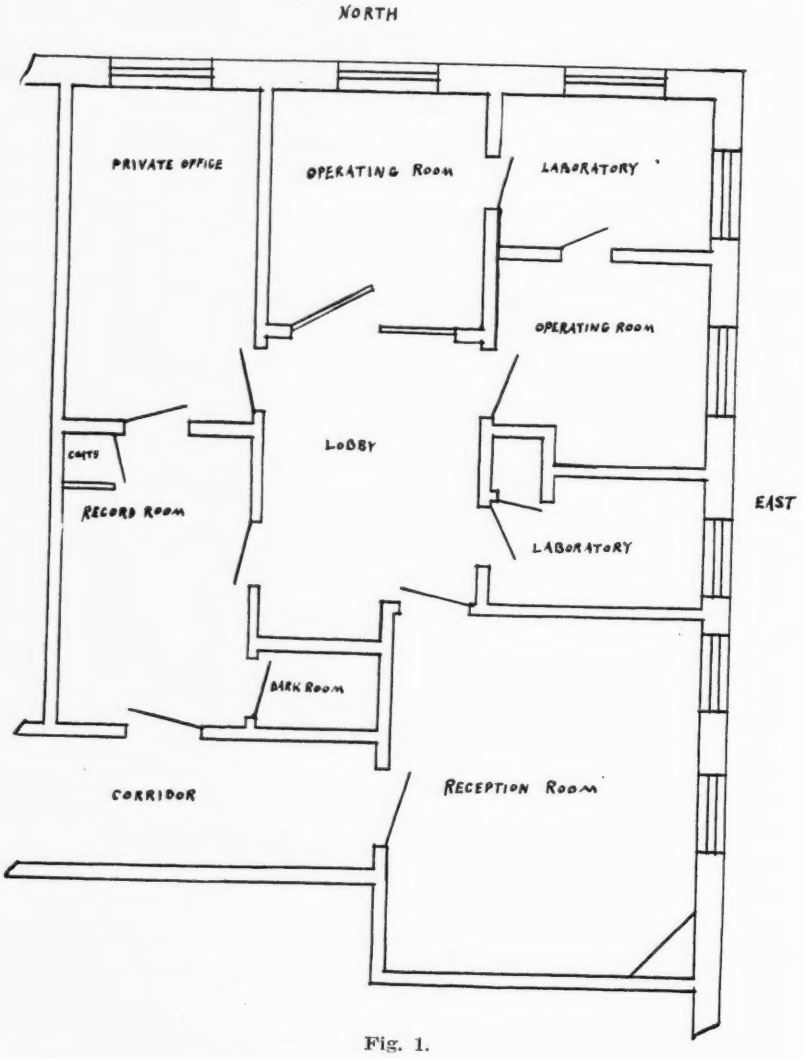


Fig. 1.

tain a city office as well as a suburban office. Others have offices in two or more cities which are so situated that certain days every week may be spent in each office.

The arrangement and equipment of offices for the practice of orthodontia are influenced by local conditions and personal requirements. In most cases the orthodontist finds it necessary to rent the most desirable space available and then have it divided and arranged as well as possible for his convenience. I was fortunate in having the opportunity of designing my present offices in a new building. (Fig. 1.)

The reception room should be attractive, but lavish furnishings are not necessary. The character of this room should be such that it will be suitable for older patients and parents as well as for very young children. At least one child-size chair is desirable, and juvenile books and magazines are essential.

Besides the reception room, an orthodontist's suite usually contains one or more operating rooms, a laboratory, and a business office. Some also include an x-ray room, a camera room, and a library. The number of rooms will depend upon the volume of practice and personal desires.

Operating rooms and laboratories should be equipped with everything necessary for a convenient and efficient practice and should contain nothing superfluous. The best equipment usually will be found to be the most satisfactory and economical over a period of years. Arrangement of equipment in the operating room should be such as to insure good light at the chair and to prevent unnecessary steps. Each operating room is equipped with a dental chair, a unit (consisting of cuspidor, engine and bracket and tray), instrument cabinet with burner, wash bowl, operating lamps, electric fan, shadow box, and a small wall case for bottles of cement, etc.

In my office, the customary drinking glass on the cuspidor unit has been replaced with a drip cup, which holds a rubber bulb syringe, and provides fresh water at all times for rinsing the patient's mouth. The temperature of the water is controlled by a water mixer located in the adjacent laboratory. Using warm water prevents the "sweating" of the cuspidor during warm weather, which occurs when cold water is employed. I find that having washbowls thirty-six inches from the floor is a decided advantage. Pedal faucets are a sanitary measure and a real convenience. Paper covers are used on the glass bracket tray. Six or more of these covers are put onto the tray at a time, the upper one being discarded when desired. The compressed air cut-off is located on the end of the instrument cabinet, easily available but out of the patient's reach. A combination gauge and adjusting valve is used to insure the desired air pressure.

I have from ten to fifteen of each kind of instrument that I generally use, including plane mirrors, cotton pliers, scalers, Eby instruments for unlocking Mershon appliances, lancets (used to cut silk ligatures), amalgam pluggers (used to press bands upon teeth), explorers and burnishers. Duplicate crown scissors, Howe pliers, flat nose pliers, and wire-bending pliers are also kept in the cabinet. Other pliers frequently used are contouring pliers, band-forming pliers, band-removing pliers, and wire cutters. Several cement slabs and spatulas are kept ready for use. Having a sufficient number of the instruments that are used in routine practice, means that sterilizing is necessary only twice a day instead of after each operation. This plan means a distinct saving of time and electric current.

I have two laboratories. In one, impressions are poured and casts are made. This laboratory is equipped with a plaster cast trimmer, a casting machine and swaging stand, as well as the usual burners, blow-pipe, etc. Wall cabinets contain casts of cases under treatment and observation.

The other laboratory, which is connected with both operating rooms, is equipped with a workbench, engine, lathe for polishing appliances, and sterilizer, and electric impression compound heater. A cabinet contains impression plaster, impression compound, and impression trays. I prefer the Brittania metal trays and keep several of each size ready for use. Small trays for impressions of single teeth are also used. The working surface of the bench is equipped with a burner and three glass bowls, one containing water, one 50 per cent sulphuric acid, and the other soda water to neutralize the acid.

The lobby, a room between the reception room and the operating rooms, contains a desk, telephone, typewriter desk, and a chair for the convenience of the parent or nurse who may accompany a patient. I do not encourage their presence in the operating room.

A door from the lobby leads into the record room. This room contains a safe, two steel cabinets, cupboards, a small coat closet, and the camera and equipment. Important records are kept in the safe. One steel cabinet contains additional letter files, x-ray films, etc. The other contains plaster casts of finished cases, filed away in cardboard boxes. Each box contains the original and final casts of a case. The boxes are numbered, and a card index is used to locate the casts.

A dark room is connected with the record room, but it is not used as such, for I find it more convenient to have my photographic films developed elsewhere, and there is a radiographer located in the building who takes care of my x-ray work. There is a door from the record room to the outside corridor.

I also have a private office, which is a convenient place for conferences.

Intercommunicating telephones supply service to the different rooms. There is a master switch which controls all the wall electric outlets, but not the ceiling lights. Therefore, the janitors may use all the lights necessary without the possibility of having an engine, lathe, sterilizer, or any other electrical unit turned on unintentionally, which might result in serious damage.

When an appointment is made for the examination of a prospective patient, the following information should be obtained: Parent's name and address, telephone number, name of the person who referred the patient to you.

Experience has proved that it is unsatisfactory to examine a new patient who is brought to your office without a prearranged appointment. Such an examination may necessarily be a hurried affair, and the patient may not be impressed with the importance of the procedure, or feel obligated to pay for it. Patients who refuse to reserve time for an examination of their children are invariably unsatisfactory prospects. If the appointment is made by telephone, an appointment card as shown in Fig. 2 is immediately mailed.

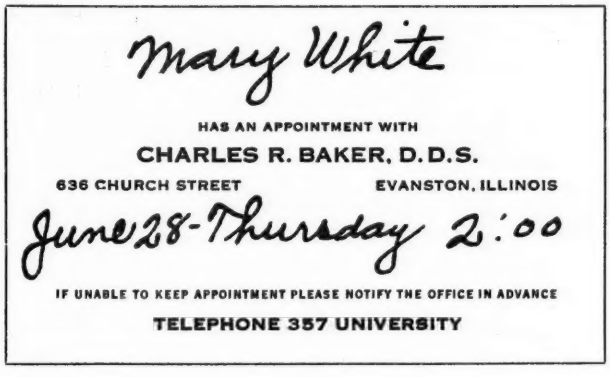
If the patient was referred to you by a dentist, it is not only courteous but a good business policy to telephone him or write a note to express your appreciation. After the treatment is concluded, it may be advisable to take the original and final record casts to his office so that he may realize what has

been accomplished. Although he probably has seen the patient during the treatment, it is unlikely that he remembers clearly the original conditions.

Appointments for examinations should be kept promptly by the orthodontist. The patient should be seated as comfortably as possible in the chair while the examination blank (Figs. 3 and 4) is carefully filled out. While this is being done, notice should be made of any apparent harmful habits, such as abnormal respiration, wetting and biting the lips, or contortions of the facial muscles.*

At this time there is a discussion with the parents, which usually includes the following subject matter: (We shall assume that the malocclusion is bilateral posteroclusion associated with mouth-breathing.) It is explained that two of the most necessary functions of any person are to breathe and to chew. If the individual is unable to breathe normally through the nose, the air is not properly cleaned, warmed, and moistened on its way to the lungs;

CONFIRMING TELEPHONE RESERVATION


Mary White

HAS AN APPOINTMENT WITH

CHARLES R. BAKER, D.D.S.

636 CHURCH STREET EVANSTON, ILLINOIS

June 28-Thursday 2:00

IF UNABLE TO KEEP APPOINTMENT PLEASE NOTIFY THE OFFICE IN ADVANCE

TELEPHONE 357 UNIVERSITY

Fig. 2.

and if malocclusion of the teeth prevents the proper mastication of food, it seems logical to believe that such a person will be seriously handicapped in his physical development and comfort. Some forms of malocclusion are also responsible for, or are associated with, abnormal facial developments, which are unfortunate handicaps in many instances.

The correction of malocclusion, therefore, should be considered primarily as a health measure. In many cases orthodontic treatment also has a marked beneficial value in improving or in correcting respiratory conditions. As to changes in facial appearance, it is explained that unless the dental arches are of correct form and unless they are in correct relationship, a normal facial development cannot possibly result; while if the malocclusion is corrected early during the age of rapid development of the lower portion of the face, it is logical to presume that there will be at least a marked improvement. However, in cases of extreme facial deformity, or if the patient is

*In actual use of the charts illustrated in this article, the headings (names, addresses, references, telephone numbers, etc.) are all written on the typewriter for clearness and uniformity.

twelve years or older, it is unwise to encourage the patient to expect too much in the matter of a facial improvement.

This being a posteroclusion case, associated with a very obvious facial deformity, it suggests the following statements: Up to this time all the tissues associated with both maxilla and mandible have been growing to harmonize with jaws and dental arches which are abnormal in form and relation. In

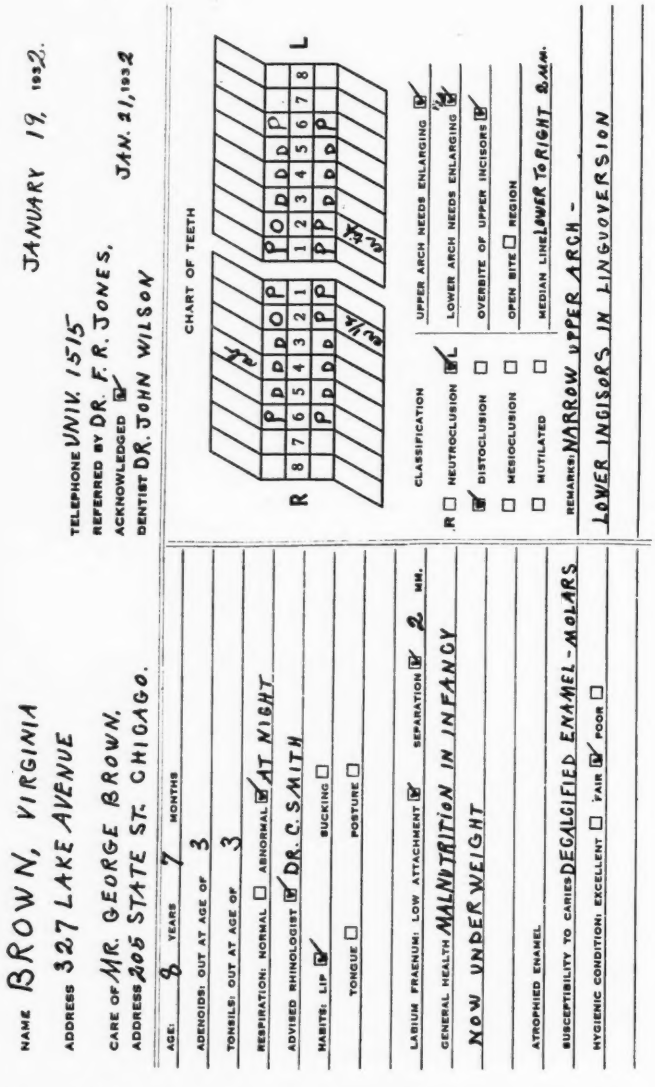


Fig. 3.

order to have a satisfactory and lasting result of corrective orthodontic treatment, all of these related tissues must be readjusted by growth and function; so it is quite apparent that the corrective treatment should be applied as early as possible and before the time of rapid growth of these parts has expired.

It is further explained that in normal occlusion every tooth of both arches makes occlusal contacts, which factor is essential in the normal development of the jaws and of the face. In malocclusion the teeth that do not occlude become extruded; sometimes they are tender, lame teeth, and their investing

tissues are not normally developed. Instead of the occlusal force, which is considerable in amount, being distributed over both entire arches, the whole pressure is borne by the teeth which do make occlusal contact, with the result that these teeth cannot assume their normal relations to what we consider the normal occlusal plane. In this particular case then there is a lack of vertical development of the investing tissues in the region of the posterior

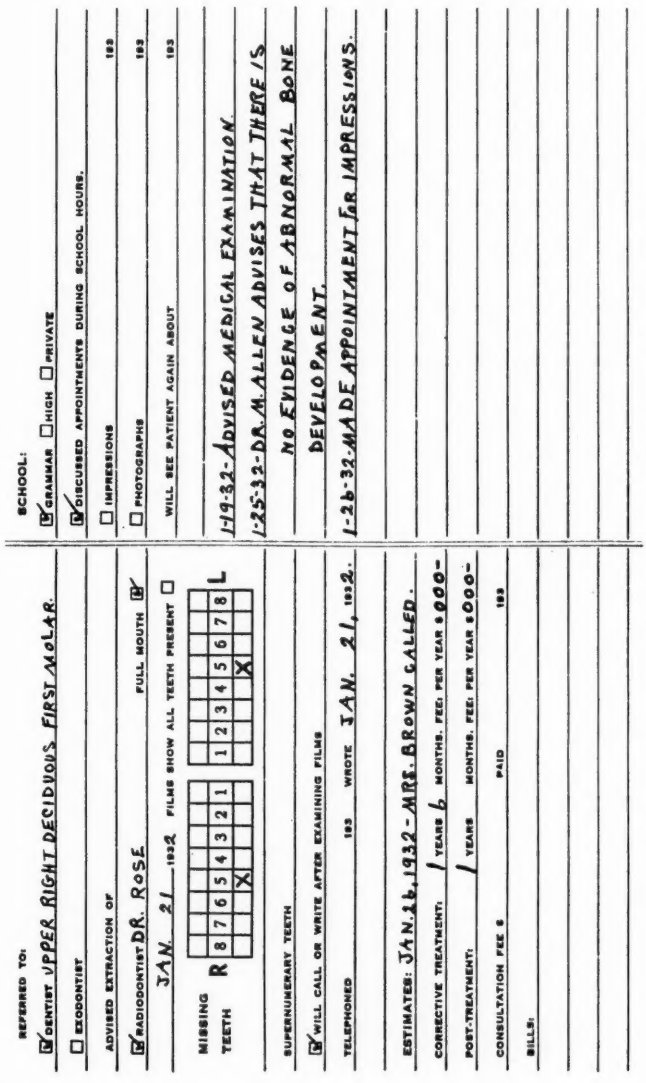


Fig. 4.—Showing reverse side of examination blank shown in Fig. 3.

teeth, which have occlusal contact, and conversely the anterior teeth are extruded. This condition prevents normal function to a marked degree.

Attention is called to injurious habits, and the parents are informed that if such habits are practiced after the treatment is finished, there will probably be a relapse of the malocclusion to some extent.

As this patient is a mouth-breather, it is explained that even if hypertrophied adenoid tissue has been removed, it is not likely that the nose will develop normally unless normal respiration is established, and this can only

be accomplished by correcting the malocclusion, thus making it possible for the lips to be closed without conscious effort. Otherwise, abnormal breathing will continue, creating, as it does, abnormal pressures which interfere with normal development. The patient is not to be encouraged to attempt to keep the lips closed or to breathe through the nose until sufficient progress in corrective treatment has been made so that it is possible to do so without considerable effort.

In considering the probable length of treatment, I explain that our work involves moving the roots of the teeth through the bony tissues of the jaws. Orthodontic treatment is not a speed contest. A gentle pressure is exerted upon the teeth, which stimulates physiologic changes in the investing tissues. These developmental changes permit the movement of the teeth and tend to maintain them in their normal positions after the corrective treatment is concluded. Too much pressure may cause an irritation instead of a stimulation, and may produce inflammation and soreness, as well as retard corrective progress.

In some cases the investing tissues respond to the pressure stimuli much more rapidly than in others. The nature of the orthodontic problem is such that it is impossible to tell accurately in advance how long treatment will be required. However, some ideas should be expressed, based upon experience with similar conditions. Parents often ask whether the corrective treatment which I have been discussing will insure permanent satisfactory results or whether later treatment may be necessary. I explain that it is my intention to correct the malocclusion and to produce conditions that are normal for the patient according to his age or degree of development. After this is done, we naturally expect a continued normal development. However, there are many possible factors, including the loss of deciduous teeth and the eruption of permanent teeth, which may interfere with normal development, and may make subsequent corrective treatment necessary.

Inquiries are often made relative to vacations for the patient. If the appliances that are left on the teeth during a vacation from the office are of such nature that progress in treatment continues during the patient's absence, there seems to be no good reason for a reduction in fee. However, in the case of an extended absence or when the appliances serve only for retention, a lower rate of fee during this period may be considered fair and proper.

It is also explained that the appliances used will be made especially for this individual case, that the pressure upon the teeth will be very gentle, that there should be no soreness or pain, and that every effort will be made to cause the patient a minimum of inconvenience.

If the case presents any unusual conditions, or if it is a mutilated case. modelling compound impressions are taken for study casts, which are studied together with the x-ray films.

The patient is then referred to a roentgenologist for full mouth x-ray films. Full mouth x-ray pictures should be carefully studied in every case before any definite decisions are made concerning the requirements of corrective treatment, probable length of treatment, or expense involved. There is

always a possibility of missing permanent teeth, supernumerary teeth, abnormally developed roots, cavities, incorrect restorations, and infections, which can be shown only by x-ray films. In some cases, particularly if there is a supernumerary tooth, additional films taken from different angles or, better still, stereoscopic films, should be used.

After the films have been examined, I telephone or write to the parents and, if necessary, make a second appointment, at which time I discuss the requirements and plan of treatment, as well as the probable time necessary for correction and posttreatment, and the probable expense involved.

In some cases there may be a question as to whether or not the case will require corrective orthodontic treatment. Possibly the removal of certain deciduous teeth or the correction of an injurious habit will permit natural developments which will encourage normal occlusion. These borderline cases are kept under observation, with appointments at intervals of three months, until a decision can be made.

If it is decided that I should treat the case, an appointment is arranged, at which time plaster impressions are taken, as well as modelling compound impressions of single teeth, usually permanent first molars or deciduous second molars, for which anchor bands, crowns, or overlays will be made. It is much easier to take impressions of a young child if the parents are not present, and this idea is suggested as diplomatically as possible.

The trays are now fitted. The importance of a properly fitting impression tray is sufficient to warrant any necessary bending or trimming of it. Usually the mandibular impression is taken first. When the plaster has set, the tray is removed and the impression is broken with the fingers and placed into an enameled ware dish, together with a card bearing the name of the patient and the date.

Impressions of the anchor teeth are made as follows: Use a small, partial tray and modelling compound. After the compound is pressed around the teeth, and before it becomes too hard, move the tray a little in order to distort the impression, making it fit the teeth loosely. Remove and chill the impression. Then place a small piece of warm compound into the impression in the region of the anchor tooth, and replace the impression in the mouth. This time it should be pressed vigorously into place and held under firm pressure until it has hardened.

Record casts are now made from the plaster impressions. The impressions of the anchor teeth are poured with artificial stone, and anchor bands are made. The stone casts of anchor teeth are filed away for subsequent use, if necessary.

After many years of making anchor bands in the mouth, which is always annoying and sometimes painful to the patient, I find that much time is saved and more accurately fitting bands are made in the laboratory. If an anchor band is to be made, the cast is made of artificial stone, and parts of the teeth adjacent to the one to be banded are trimmed away. If a crown is to be used, the cast is made of cast plaster. If an overlay is desired, the cast is made of an investment material on which the overlay may be cast.

I prefer seamless crowns or overlays for deciduous molars, and find that they have distinct advantages over bands in cases of short or partially erupted permanent molars, and for use on teeth with atrophied enamel.

The following remarks about bands would apply equally well in case seamless crowns or overlays are used on anchor teeth:

At the next appointment, a pair of anchor bands is fitted. If separation of the teeth is necessary, a medium-sized orthodontia silk thread is used for the purpose, which is usually applied the day before bands are fitted. If I am making a Mershon lingual appliance, the half round tubes are now soldered to the bands after their correct location has been marked. The bands are replaced on the teeth, and if buccal hooks are required, their location is marked with a pointed instrument. If a labial arch appliance is to be made, the anchor bands are simply fitted to the teeth. In either case, a modelling compound impression of the entire dental arch, with the anchor bands upon the teeth, is now taken. Each impression is placed in a small dish, which contains a card bearing the patient's name, together with notes concerning the appliance to be made. Later the time of the next appointment is added.

The impression is poured with artificial stone and the appliance is made. Buccal tubes are soldered to the bands on the model. Wires for labial and lingual arches are annealed for ease of manipulation, and later the temper is restored by heating and allowing them to cool slowly. Appliances are then pickled, polished, and filed away in a small Manila envelope until the patient's next visit.

Before appliances are set, the general practitioner should see that the mouth is in a healthy condition, that the teeth are clean, that loose deciduous teeth and roots are extracted, and that all necessary operative work is done.

The orthodontist should polish the teeth to be banded and place the appliance in the mouth so as to be sure that it fits exactly as intended. The appliance is then removed, washed in running water to remove saliva, and the bands are dried with cotton pellets and compressed air (about 15 pounds' pressure).

In the case of a labial appliance, the anchor bands are cemented separately, after which the arch wire is applied. Before cementing a band, vaseline is placed into both ends of the buccal tube to prevent cement adhering thereto.

Cotton rolls are used to keep moisture from the teeth during the process of cementing the bands. The teeth are also wiped carefully with cotton pellets and dried more thoroughly with compressed air (5 or 6 pounds' pressure). In former years, the teeth to be banded were dried by the use of alcohol followed by warm air; but better results are obtained when the method just mentioned is followed. The cement is mixed to a thick (not creamy) consistency and placed in the band, which is forced into place upon the tooth. The cotton rolls are now removed, and as hydraulic cement is used, a stream of water is applied. A cotton pellet saturated with water is also used to wipe

off some of the excess cement, especially around the occlusal margin of the band. A wire is run through the buccal tube to dislodge any cement which it may hold. About five minutes later all excess cement is removed.

In setting a Mershon lingual appliance, I believe that the usual custom is to cement each anchor band separately and then to apply the arch wire. I prefer to assemble the appliance first and cement both bands at the same time. My procedure is as follows: Place the assembled appliance on the teeth so as to be sure that it fits correctly; remove and dry the appliance. Cover the outside lingual surfaces of bands and locking devices with vaseline so that excess cement may be removed easily. Now the teeth are dried, cement is mixed, and the appliance is placed upon the teeth. Water is applied, and the excess cement is removed in the usual manner.

When an appliance is set, usually it should be in a passive state and should not exert pressure upon any of the teeth. In some cases even the simplest orthodontic mechanism, well made and carefully cemented, will be a source of at least some annoyance for a few days. Therefore, I seldom apply finger springs or adjust the appliance so as to cause pressure upon the teeth at the time the appliance is set.

In corrective treatment, I endeavor to use the best and simplest appliance to do the thing which, in my opinion, is the first requirement of such treatment. After that first step is accomplished, it may be possible to alter or make over the appliance in order to continue the treatment most effectually. In many cases, however, it is best to scrap the first appliance and make a new one for the next phase of treatment.

For psychologic reasons, as well as for the best interests of the patient, I believe that it is advisable to commence corrective orthodontic treatment in a deliberate manner. My purpose is not to see how quickly I can get appliances on the teeth, but how well I can do so with the minimum of annoyance to the patient.

My routine is about as follows:

First Appointment:

Take plaster impressions.

Take double compound impressions of anchor teeth.

The casts of the case are studied and the treatment is planned before the patient's next visit.

Second Appointment:

(We shall assume that the case is one of posteroclusion.)

Fit mandibular anchor bands and take a modelling compound impression.

Third Appointment:

Set mandibular lingual appliance, which may have a soldered lingual or a Mershon lingual arch wire.

Fit maxillary anchor bands and take a modelling compound impression.

As soon as an appliance is set, the patient is cautioned not to tamper with it; and he is also told that the one important rule he must follow is not to eat sticky candy, such as caramels, taffy, or butterscotch. The necessity of keeping all appointments is also stressed at this time.

Fourth Appointment:

Set maxillary labial arch wire appliance.

Solder finger springs, if their use is indicated, to mandibular appliance.

Fifth Appointment:

Solder hooks to maxillary arch wire for intermaxillary elastic ligatures.

To the parents, as well as to the patient, I explain the use of the intermaxillary elastics, and that they must be worn all the time, except during meals, if proper progress and results are to be expected; that if the patient does not cooperate thoroughly, the treatment will take much longer and consequently will cost more.

The appointments described are of thirty minutes each, a few days apart. Subsequent appointments are usually made at intervals of two or three weeks. Attachment bands (which are made directly upon the teeth) are used when needed, and proper adjustments or changes are made during the progress of the treatment.

In the event that a lingual arch wire appliance is broken, or for some other reason needs to be repaired, I believe that the best method of getting satisfactory results is to remove and refit the anchor bands, take an impression and follow the same routine used in making the original appliance. By so doing you will have an appliance that fits accurately and one that can be adjusted to function exactly as you desire.

It is poor economy of time to have too many appointments in a day, for if a change in an appliance is indicated which may involve a change of finger springs, making an attachment band or cementing a loose band, it should be done without delay. If postponed, the progress of treatment may be retarded, and this is not fair to the patient. If the unexpected operations are performed and more than the allotted time is used, it may be impossible to care properly for the patients who follow in the day's program. As some of our little patients have other appointments to keep, we should always try to be ready for them at the appointed time and not keep them overtime.

My *appointment book* is of the loose-leaf type with pages printed as shown in Fig. 5. A typewritten copy of the day's appointments is placed in my operating room each morning. When a patient calls, I refer to this sheet, noting the time reserved and whether or not there is a notation as to plans for the current visit. I also look over the *case record card* as shown in Figs. 6 and 7. Entries here show the date of the last appointment and record any changes made in the treatment or appliance at that time.

The operating chair should be adjusted so that the patient's mouth is on a level with, or slightly below, the elbow of the operator. This is the most comfortable operating position.

If intermaxillary elastic ligatures are worn, they are removed and the water syringe is used to rinse the mouth thoroughly. Ligatures if present are cut and discarded; arch wires are removed and polished on the lathe. Usually the teeth are polished, especially if labial arch wires are used, and the case is now carefully studied. The original record casts are referred to at frequent intervals. The cemented bands and other parts of the appliance are examined. Necessary adjustments of the appliance are made, and new

TUESDAY. JUNE 21, 1934.

9			
9.15			
9.30			
9.45			
10	Mary Edwards	✓	SEP. see 6-22
10.15	John Benson	X	
10.30	Peggy Kramy	✓	leaving 7-3
10.45	1009		
11	Bill Corbin	✓	Cx. retainer
11.15	George Neill	✓	fit bands
11.30			
11.45	Sue Sample	—	see 6-23
12			
1			
1.15			
1.30	Mary Calkins	✓	sol. fix. sfgs.
1.45			
2	Robert Connell	✓	cavity filled?
2.15			
2.30	Ed Koss	✓	teeth clean?
2.45			
3	Mary Martin. tel 0112	✓	Exam.
3.15	135 Green St.	Ref. DR. DAVIES	
3.30	Kennath White	X	
3.45			
4	Elmer Stevens	✓	make band 7
4.15			
4.30	Ted Murray	✓	Cx. retainer.
4.45			
5			
5.15			
5.30			

Fig. 5.

finger springs or other attachments are soldered. If major changes in the appliances seem desirable, plenty of time is reserved for this purpose at the next appointment. The arch wires are now replaced. Intermaxillary elastic ligatures are applied if needed, and the patient is asked whether he has plenty of these rubbers to last until his next visit. If the teeth have not been properly brushed, a little lecture on this subject is advisable. If the patient has an injurious habit that we are trying to break, it is a good plan to make a few earnest remarks on the subject every time he calls in order to keep him impressed with the importance of correcting it.

As soon as actual progress in the treatment is apparent, it is a good plan to show the parents what is being accomplished, using the original record

casts for comparison with the teeth in the mouth. This practice should be repeated from time to time during treatment of the case.

The patient should be referred back to his dentist at regular intervals to have his teeth cleaned and examined.

If broken appointments occur frequently, it is a good plan to notify the parents in writing and to request their assistance in encouraging better cooperation. In the event that objections are made to the length of treatment, you will then have evidence of having given notice of this lack of interest. When an appointment is broken, the patient is immediately called by telephone and a new one made.

I use the simplest types of fixed retaining appliances, usually consisting of lingual or labial arch wires and single bands for teeth which have been rotated. I have never experienced complete satisfaction in the use of a retaining appliance which could be removed by the patient.

When a patient is accepted for treatment, the following letter is sent to the parent:

Mr.----------

Address----------

Dear Sir:

Regarding the orthodontic treatment necessary at this time for your son----------, I wish to advise that while it is impossible to tell definitely in advance concerning either the length of treatment or the expense involved, in my opinion, corrective treatment will be required for about----------years. The fee will be at the rate of $-------- per year and may be paid as follows for the first year of treatment:

Enclosed bill	$000
Dec. 1	000
April 1	000
August 1	000
	$000

Later bills, if necessary, at the same rate of fee.

After the tooth movement is finished, and during the posttreatment period of wearing retaining appliances, there will be a charge at the rate of $------ per year. This retention period will probably be about------year.

I prefer that you have your own dentist examine the teeth at regular intervals during my treatment of the case, but I will report anything that I may notice that requires his attention.

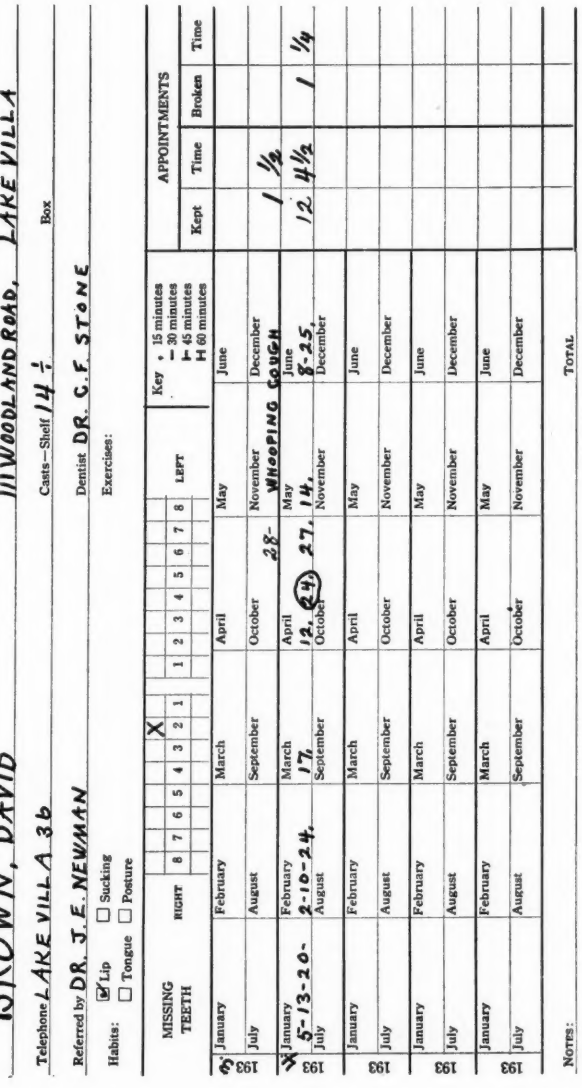
In order to get the best results in the shortest time, the cooperation of the patient is essential, particularly regarding the keeping of appointments and following instructions.

A ledger card as shown in Fig. 8 is used to record the financial status of the case.

One of the most perplexing problems of a young orthodontist is deciding upon the amount of fee to charge for his services. My first plan was to make a stated fee for each case. A few years later I fully realized that this scheme was not economically sound. Many appointments were broken, and generally the cooperation of the patient was not evident. Treatment periods

were always more extensive than anticipated, and sometimes patients would return years later, feeling that I was obligated to treat malocclusion that had developed long since I had seen the case.

My next plan was to collect an initial fee when treatment was commenced, followed by monthly payments. This plan did not work out as expected. During some months the payments did not cover the expense of materials,



BROWN, DAVID — 111 WOODLAND ROAD, LAKE VILLA

Telephone LAKE VILLA 36 — Casts—Shelf 14 1/2 — Box

Referred by DR. J. E. NEWMAN — Dentist DR. C. F. STONE

Habits: ☑ Lip ☐ Sucking ☐ Tongue ☐ Posture — Exercises:

MISSING TEETH — RIGHT 8 7 6 5 4 3 2 1 — LEFT 1 2 3 4 5 6 7 8

Key: • 15 minutes — 30 minutes ⊢ 45 minutes H 60 minutes

				APPOINTMENTS			
				Kept	Time	Broken	Time
193	January	February	March	April	May	June	
	July	August	September	October	November	December	
193	January	February	March	April	May	June	
	5-13-20- July	2-10-24. August	17. September	12. (24) October	27. 14. November	8-25. December	
193	January	February	March	April	May	June	
	July	August	September	October	November	December	
193	January	February	March	April	May	June	
	July	August	September	October	November	December	
193	January	February	March	April	May	June	
	July	August	September	October	November	December	
				TOTAL			

WHOOPING COUGH — 28- — 1 1/2 — 12 4 1/2 — 1 1/4

NOTES:

Fig. 6.

laboratory work and services; and if the patient was absent for a month the parents objected to making the monthly payment, in spite of the fact that during other months the patient had four or five appointments.

Some men make an initial charge for appliances and then charge a stated fee for each appointment, making an additional charge for such items as cementing bands, soldering attachments, etc. The plan which I have followed for perhaps fifteen years, and which has proved quite satisfactory, is to make a yearly fee for the corrective treatment and a yearly fee for posttreatment.

In some cases it may be advisable to charge more for the first year than for the second or third year of treatment, but the plan is sound and it is equitable to the orthodontist as well as to the patient. The yearly fee is usually paid in three or four instalments. If there are delays during treatment, occasioned by the loss or eruption of teeth, necessitating a rest period, or if the patient

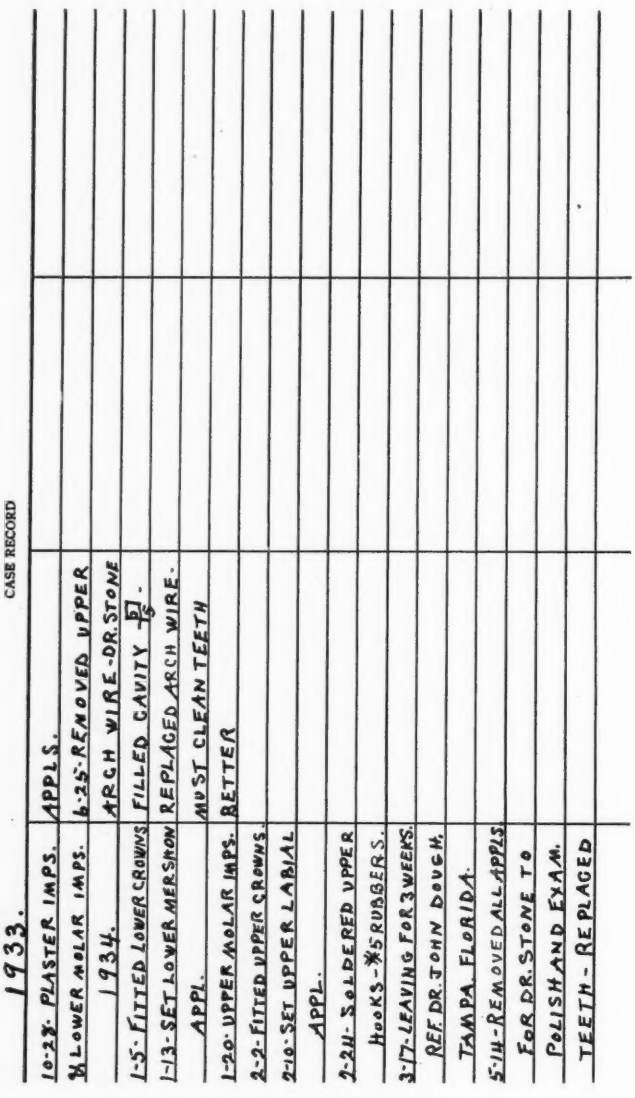


Fig. 7.—Showing reverse side of card shown in Fig. 6.

is absent for an extended time, a suitable allowance can be made by sending bills a month or two later than originally planned.

During the posttreatment period, usually appliances are worn, and the orthodontist is obligated to continue his interest in the case until satisfactory results are assured. I believe that you will agree that a fee is warranted for this service. It is a good plan to send bills promptly when due and to reply to letters immediately upon their receipt. Carelessness in business methods will often create a careless attitude on the part of others concerning their obligations to you.

At times during corrective treatment and during posttreatment, as well as before treatment is undertaken, it is advisable to see patients at intervals of from two to six months. In such cases, when it is not practicable to make a definite appointment, the name is put on what may be termed the *call list.* This record is kept in a book having a page for each month. The patient's name and telephone number are entered on the correct page with any necessary notations regarding the case.

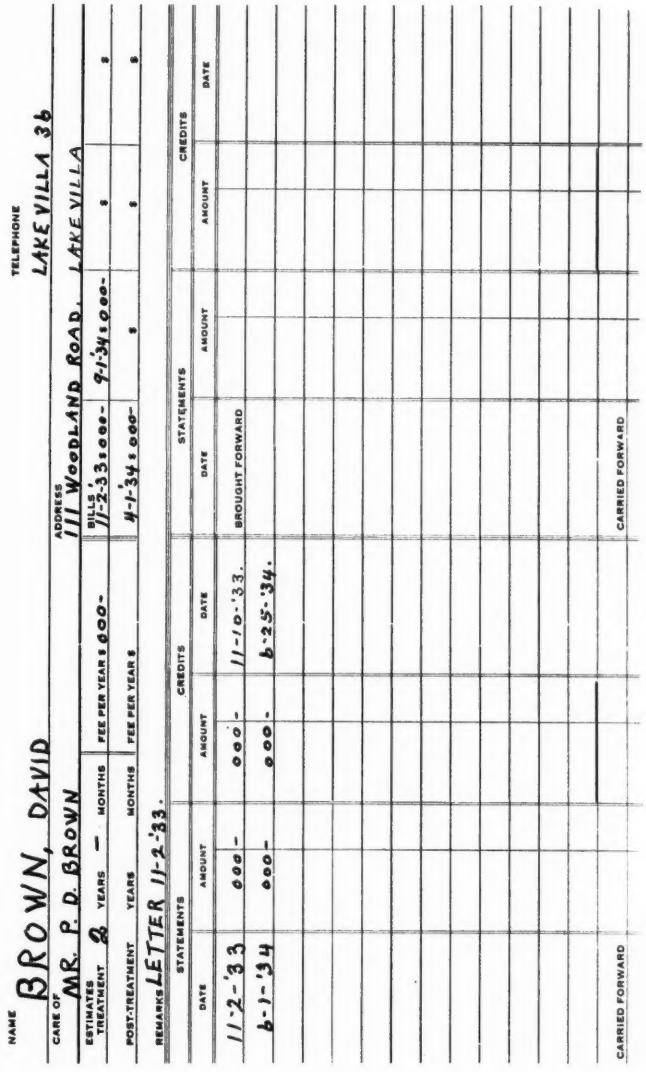

NAME BROWN, DAVID
TELEPHONE LAKE VILLA 36
CARE OF MR. P. D. BROWN
ADDRESS 111 WOODLAND ROAD, LAKE VILLA
ESTIMATES TREATMENT 2 YEARS — MONTHS FEE PER YEAR $ 600- BILLS 11-2-33 $ 1000- 9-1-34 $ 1000-
POST-TREATMENT YEARS MONTHS FEE PER YEAR $ 11-1-34 $ 600-
REMARKS LETTER 11-2-'33.
STATEMENTS DATE 11-2-'33 AMOUNT 600- 6-1-'34 600-
CREDITS DATE 11-10-'33. AMOUNT 600- 6-25-'34. 600-
STATEMENTS DATE BROUGHT FORWARD AMOUNT
CREDITS DATE AMOUNT
CARRIED FORWARD
CARRIED FORWARD

Fig. 8.

A *vacation list* is also kept. When a patient leaves for an extended absence, the name is entered together with the probable time of his return. If any references are made concerning orthodontists out of town, this information is added. In case the patient does not return at about the expected time, we call up his home and try to locate him.

A *correspondence folder* is used for each patient. This contains the examination card, all correspondence bearing on the case, photographs, etc.

Any arrangements made verbally at the office or by telephone are promptly confirmed by letter, a copy of which is kept in this folder. X-ray films, however, are kept in a separate cabinet, at the suggestion of a fire insurance agent.

A *list of new patients* is kept in a book for this purpose and is a valuable record of one's progress each year.

I also keep a *list of the monthly bills* sent. The amounts due are entered in five columns as follows: 1, new bills due this month; 2, bills due one month ago; 3, bills due two months ago; 4, bills due three months ago; and 5, bills due for more than three months. This simplifies the problem of knowing which bills are not being paid promptly without checking through the card system.

I am not conceited enough to believe that the methods I use in routine practice cannot be improved upon, or that they would fulfill the requirements in other offices without at least some modifications. They have been adopted as a result of much experimenting, which included the trial and discard of many ideas and the alteration of others; and I shall continue to operate along the plans described until I am able to improve them.

SOME NOTES ON THE DENTITIONS OF ANGLO-SAXON SKULLS FROM BIDFORD-ON-AVON, WITH SPECIAL REFERENCE TO MALOCCLUSION*

K. Corisande Smyth, L.D.S., R.C.S., London, England
Introductory Note by Professor J. C. Brash, M.A., M.D.

SOME account of malocclusion in the Bidford-on-Avon collection of sixth-century Saxon skulls was included in the section on "Historical Incidence" in the first of my lectures on "Etiology," published by the Dental Board of the United Kingdom in 1931. Miss Smyth had kindly provided me with a survey of the irregularities and malocclusions found in these skulls; and the present paper is the fulfilment of a hope then expressed that a separate account in greater detail might later be published.

Full details of the Bidford excavations, with a discussion of the site, its relation to other Anglo-Saxon cemeteries, and of the evidence which suggests that the Bidford cemetery is to be assigned to the early part of the sixth century, are to be found in two publications by Mr. John Humphreys and his collaborators. ("Archæologia," 1924, 73, 89; 1925, 271.) These papers are mainly occupied with a detailed and splendidly illustrated description of the archeologic material provided in abundance by the excavations; they include plans of the cemetery, and tables giving details of the individual graves and the grave furniture found in each; there are also some excellent photographs of skeletons and grave furniture *in situ*.

Appended to each paper will be found notes on the cranial and other skeletal characters; and the only further introduction here required is a statement of the amount of skeletal material available. The total number of interments uncovered was approximately 373; of these 151 were urn burials, only 31 of which, however, were reasonably well preserved. Of the 222 ordinary burials, the skeletal remains were found to be quite fragmentary in 42; complete skeletons, or portions of skeletons according to the degree of preservation, were thus obtained from 180 burials.

As might be expected, the majority of the skeletons are those of mature adults; yet the whole provides a complete range from infancy to "old age." It was found possible to determine the sex in 100 (57 male, 43 female). The number available for the study of the teeth is, however, much less than the total number of individuals represented by skeletal remains, for the reason that in many the facial skeleton was lacking, or so damaged that it could not be reconstructed.

Apart from all other evidence, the conclusion is inevitable from a consideration of the total number of interments, with the age and sex distribution of

*Transactions of British Society for the Study of Orthodontics, 1933.

the individuals represented, that we are dealing with the burial place of a community. In the absence of evidence, however, of the length of time during which the cemetery was used and of knowledge of the probable death rate, it is not possible to estimate the size of that community.

It should be added that the Bidford collection is preserved in the Anatomical and Dental Museums of the University of Birmingham, where it was placed by the Bidford Cooperative Society to whom the site of the discovery belonged. *J. C. B.*

The examination of these skulls and fragments of maxillas and mandibles was undertaken with a view to discovering what types of malocclusion, if any, were represented in this Anglo-Saxon community. A casual glance through the collection revealed the fact that perfection of form was not a universal characteristic of these arches, and the actual tabulated results of a minute and systematic investigation were quite surprising.

The total number of skulls and fragments which was considered fit for classification was thirty-nine, and out of these no more than five exhibited what could be described as perfectly or very nearly perfectly normal occlusion—about 13 per cent. Twenty-one cases showed some obvious form of malocclusion —over 50 per cent—and the remaining thirteen specimens showed slight or very slight degrees of irregularity. The total percentage of malocclusion thus is about eighty-seven.

Certain features of the specimens, notably the very heavy attrition of the teeth in some cases, made it impossible to apply all the tests of normal occlusion, and also made it extremely difficult correctly to classify the types of occlusion. But very careful allowance was made for these factors in every case. The standard of selection of the normal cases was very stringent. It was similar to that employed in the selection of cases of normal or ideal occlusion in children used for the investigation recently completed for the Dental Committee of the Medical Research Council, and is described in the special report referring to this.

Professor Brash[1] has discussed the historical incidence of malocclusion with special reference to Sir Arthur Keith's pronouncements on this question. It is therefore interesting to compare the incidence of malocclusion in these sixth-century skulls with the incidence observed in those of other periods. In 1925 Sir Arthur Keith[2] stated that "every fourth or fifth child or adult we examine possesses a palate which, compared with the older type, may be described as both deformed in shape and reduced in size." At one time he examined twenty students of the London Hospital and found that ten of them showed a greater or less degree of irregularity. Sir Arthur's most recent general estimate is that there is some degree of contraction of the palate and irregularity of the front teeth in at least 25 per cent of the population of the British islands. From the wording of this statement it would appear that he had not taken into account the less noticeable forms of malocclusion, such as close bite and displacements and rotations of the teeth distal to the canines. However, it is probably fair to compare those cases which he regards as definitely abnormal with the

twenty-one cases of "obvious malocclusion" among the Bidford collection. The total number in each investigation is very small—twenty and thirty-nine—but the proportion of cases of obvious malocclusion is almost identical.

Fig. 1.—Young skull, showing overlap of incisors.

Another investigation into modern occlusal conditions was that planned by the Medical Research Council, already referred to.[3] Many thousands of children were examined in the search for a large series of cases of normal occlusion. The final percentage of cases selected was as low as six. Allowing

for 4 per cent of cases rejected for incidental reasons, the remaining 90 per cent included all kinds and degrees of malocclusion. This is probably a reliable figure, as the numbers examined were very large and the criteria employed were very definite; it is perhaps not entirely a coincidence that it tallies so closely with the percentage figure for malocclusion in the Bidford collection, selected by the same observer working with the same criteria as far as possible. It is interesting to remember that in the one case the search was for normal or ideal conditions, while in the other case the study of malocclusion was the object.

Extensive observations on ancient skulls are rare, and those that exist do not seem to take account of any of the finer points of occlusion, but confine themselves chiefly to the shape of the palate. Sir Arthur Keith's comment upon his comparison of fifty pre-Norman skulls with fifty modern skulls is as follows: "Among collections of modern skulls we see teeth, jaws and faces as robustly

Fig. 2.—Change of anteroposterior relationship associated with wearing down of teeth. (Illustration by courtesy of the Dental Board.)

and symmetrically developed as in ancient times, but they occur in a decidedly diminished proportion." To quote Professor Brash on this point, with reference to the Bidford skulls: "Although the frequency of some recognizable malocclusion is very great in the Bidford collection, yet the average *degree* of malocclusion is not nearly so great as in modern British people, and it consists to a considerable extent of irregular positions of individual teeth. On the whole the palates of these Saxons are notably broader than the average modern English palate."

One more quotation will be sufficient to indicate the opinion of modern experts on this point of the historical incidence of malocclusion. Hellman says: "The early forerunners of modern man bear abundant evidence of malocclusion of the teeth . . . the Eskimo presents an unexpected frequency of it."

From a practical point of view, the interesting fact seems to be that, in spite of broad palates and well-developed arches, all types of individual irreg-

ularities of the teeth can and do exist. When the more gross forms of malocclusion occur, they seem to be accompanied by certain degrees of lack of bone development, of the same type to which we are accustomed in the modern individual. These gross forms of malocclusion apparently occur more rarely than in the modern community, but the Anglo-Saxon community as a whole did not possess the proverbially "perfect set of teeth." Professor Brash says that we can hardly escape from the conclusion that the causes, whatever they may be, which are responsible for malocclusion were already at work among those Saxons of the sixth century.

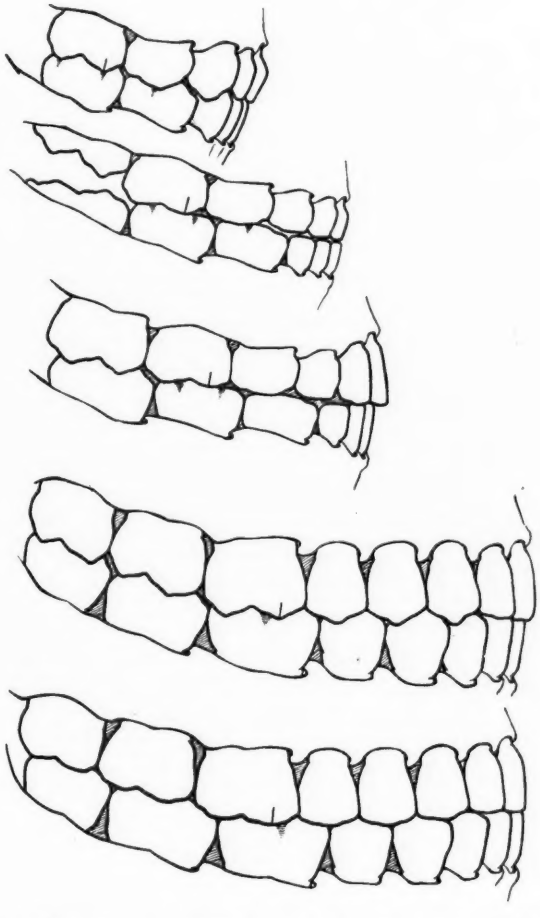


Fig. 3.—Diagram of changes in occlusion with age (S. Friel).

The most striking feature of the collection as a whole is the great amount of attrition of the teeth. It is, of course, not a rare condition in ancient skulls, and the sites at which the wear occurs are a matter of common knowledge, but it is interesting to note the details as they affect occlusion. Some recognizable degree of attrition is present in every specimen, although in young skulls, in which the third molars are not erupted, the wear is chiefly confined to the first permanent molars. Only eleven specimens can be said to show less than a "medium" amount of wear; in eight cases the degree of wear can be described as very heavy, or "excessive." Third molars may be worn down to flat surfaces.

In the older skulls this wearing down of the occlusal surfaces has had a profound effect upon occlusion. The "occlusal plane" is actually a flat surface, and the mandibular teeth, also worn to a flat plane, can slide forward as far as they like. The edges of the incisors are worn down very early in the process, so that there is no longer any overlap to check the mandibular teeth in their excursions forward. The term "no longer" is used advisedly, since an overlap is definitely present in a large majority of the young skulls (Fig. 1). The edge-to-edge occlusion which is present so frequently in older specimens of these and other ancient skulls, and which is so often quoted by anthropologists, is un-

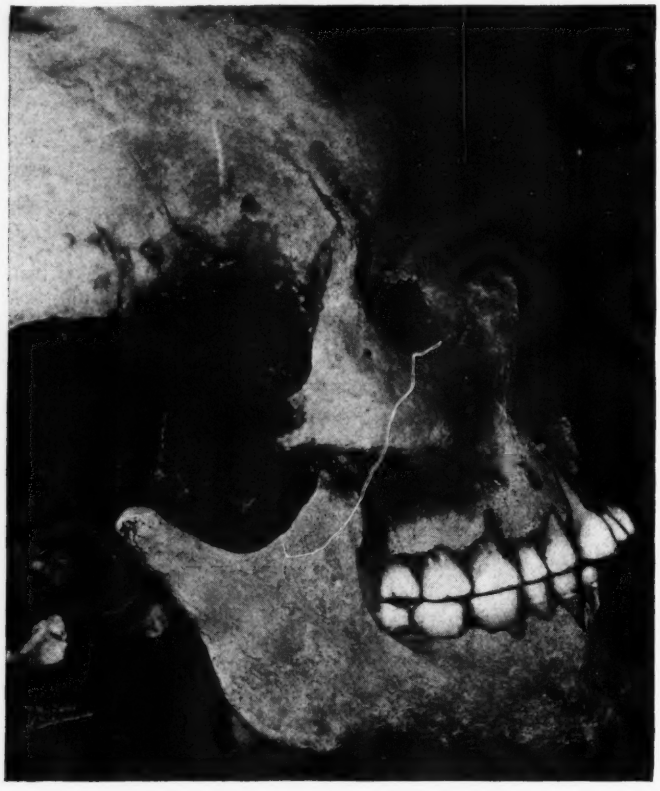


Fig. 4.—Mandibular postnormal occlusion (bilateral), with labial inclination of incisors.

doubtedly the direct result of the wearing down of the occlusal surfaces of the teeth. In many cases the anteroposterior arch relationship has become actually prenormal in this way. In the same way it is possible for an originally postnormal relationship of the mandible to correct or improve itself as the result of wear and a consequent forward swing of the mandible (Fig. 2). It is interesting to compare this exaggerated change of arch relationship which occurs as the result of excessive wearing down of the teeth, with the modern normal series of occlusal changes as described by Dr. Friel at the First International Orthodontic Congress,[4] and on subsequent occasions. His diagrams show that exactly the same thing is occurring, but on a smaller scale, and much more gradually (Fig. 3). Dr. Friel has always insisted very specially upon the necessity for physio-

logic wearing down of the deciduous teeth in order to allow for the normal forward movement of the mandibular teeth in relation to the maxillary ones. Certainly the fact that such a great amount of wear does take place even early in life in these Saxons, seems to be one of the reasons why a prenormal relationship is so much more common that a postnormal one.

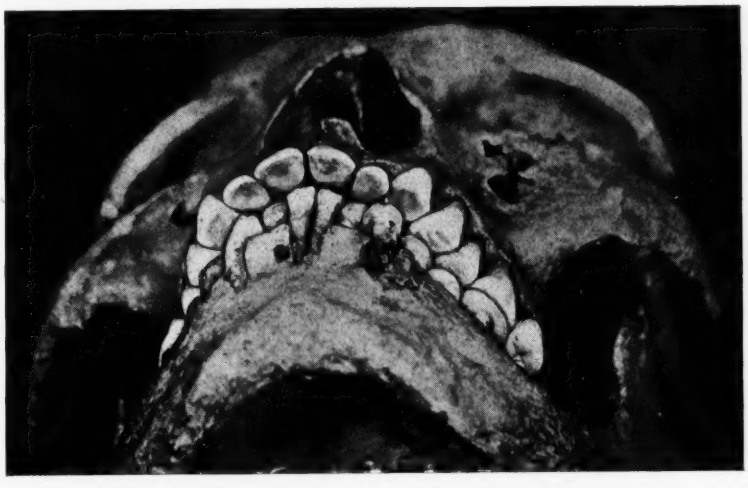


Fig. 5.—Same specimen as Fig. 4, showing close bite.

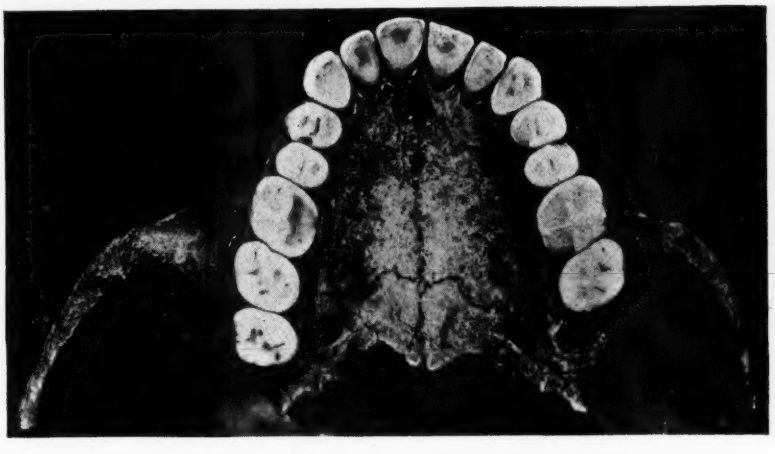


Fig. 6.—Maxilla of same specimen as Figs. 4 and 5, showing attrition of lingual surfaces of teeth.

Another effect of heavy wear is to destroy the contact points of adjacent teeth. The teeth then commence to move individually, influenced no doubt by mastication. Severe rotations occur in this way.

In several specimens the attrition has been sufficient to expose pulp cavities. It was fortunate for the members of the community that in most cases of heavy attrition there was a definite reaction of the pulp, evidenced by solid deposits of secondary dentine.

Abnormalities of anteroposterior arch relationship are probably the anomalies of the greatest orthodontic interest. The relationship could be ascertained

in only twenty-five of the cases. There is only one case in which full bilateral mandibular postnormal occlusion can be actually demonstrated, with protrusion of the maxillary incisors (Fig. 4). Every indication of postnormality of the mandible is present. The incisors are not only severely crowded, but they are in supraplacement, with a marked degree of close bite (Fig. 5). This case would presumably fall into Angle's Class II, Div. 1. The maxillary arch has a

Fig. 7.—Mandibular postnormal occlusion, with lingual inclination of central incisors (Illustration by courtesy of the Dental Board.)

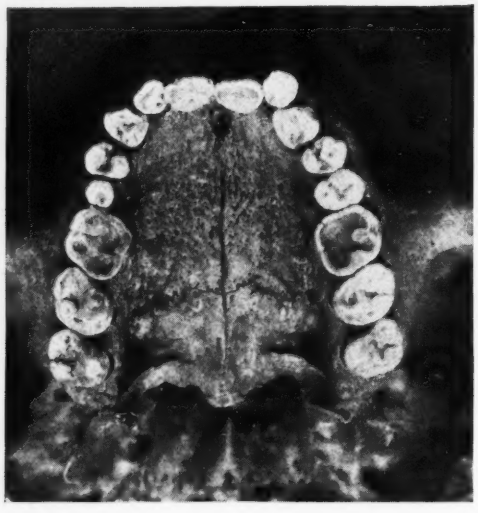


Fig. 8.—Same specimen as Fig. 7, showing abnormally small right maxillary, second premolar, with mediolingual rotation of first permanent molar on same side. (Illustration by courtesy of the Dental Board.)

somewhat V-shaped form, and the attrition of the lingual surfaces of the teeth is very marked (Fig. 6).

In another case there is a very slight degree of postnormal occlusion on the left side (Fig. 2), while on the right it appears to be quite severe (Fig. 7); but on close inspection it can be seen that an abnormally small second premolar has

allowed the maxillary first permanent molar to come forward unduly, and exaggerated the postnormality of the mandibular teeth. The actual manner in which the molar has come forward and rotated can be seen well in the occlusal view (Fig. 8). This is a case corresponding to Angle's Class II, Div. 2, as the retrusion of the maxillary central incisors demonstrates.

The canines, instead of being placed labially, as they usually are in this type of case, are seen to be in an unusual position of mediolingual rotation, with a slight lingual displacement also. It is a significant fact that this is the occlusion of a skull which is, to quote Professor Brash, "that of a powerfully built male." It is highly probable that the occlusion was more definitely postnormal before the wearing down of the teeth, the maxillary incisors in particular, took place.

Fig. 9.—Unilateral mandibular postnormal occlusion, with labial inclination of incisors.

Four cases show unilateral postnormal occlusion, not of a severe degree. One of them has a maxillary arch which is narrow in the premolar region—a "saddle-shaped arch." This case also shows marked rotation of the right first permanent molar; there is a marked degree of close bite, with supraplacement of the mandibular incisors. One of the remaining three cases of unilateral postnormal occlusion cannot be classified for overlap, as the mandibular incisors are absent, but shows marked labial inclination of maxillary incisors (Fig. 9). The remaining two cases both have an overlap of the maxillary incisors, one to a marked degree.

Before leaving the question of postnormal occlusion, a maxilla will be shown which has no mandible (Fig. 10). The occlusion, of course, cannot be ascer-

tained, but here is an example of the V-shaped maxillary arch, narrow in the canine region, and with mediolingually rotated first permanent molars.

To recapitulate, we find, among twenty-five specimens, six cases of post-normal occlusion, three of which show marked close bite, two protrusion of maxillary incisors, another retrusion of maxillary incisors. The saddle-shaped

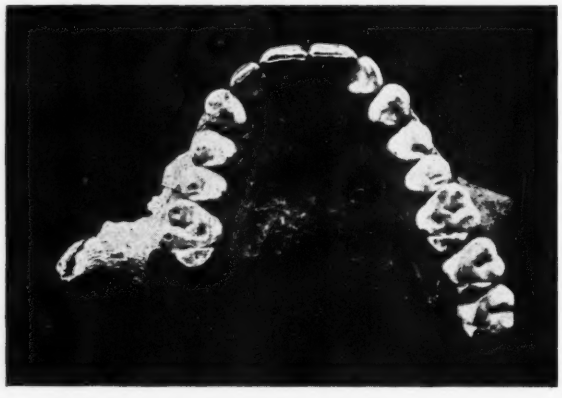


Fig. 10.—V-shaped maxillary arch. (Illustration by courtesy of the Dental Board.)

Fig. 11.—Mandibular prenormal occlusion.

arch and the V-shaped arch are both represented, with good examples of molar rotation.

Mandibular prenormal occlusion, as distinct from ordinary forward movement as the result of wear, can claim only two cases out of the twenty-five, and even one of these might be simply an exaggeration of the usual amount of forward swing of the mandible. This case, however (Fig. 11), shows a definite mandibular protrusion. Edge-to-edge bite of the incisors is extremely common.

Lingual occlusion of all maxillary molars is seen in one case (Fig. 12). There is one case of a single maxillary molar in lingual occlusion.

Close bite, as has been mentioned, occurs in several cases, two being very severe.

Open-bite is the only form of abnormal arch relationship which cannot be shown in this collection. The specimen seen in Fig. 18 appears to show open-

Fig. 12.—Lingual occlusion of maxillary molars (bilateral).

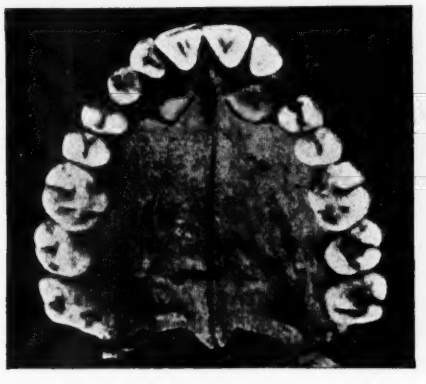


Fig. 13.—Misplaced maxillary canines.

bite, but some of the teeth are placed incorrectly in their sockets and prevent the jaws being put into occlusion.

Individual irregularities of many kinds occur, and are classified under five headings as follows: (1) bodily displacement; (2) inclination; (3) rotation; (4) imbrication; (5) separation.

(1) Bodily displacement: Three or four cases occur. The worst example is one in which both maxillary canines are placed in the palate, directed medially

and lingually (Fig. 13). Supraplacement of mandibular incisors has already been mentioned. At least one case shows displacement of mandibular incisors (Fig. 14). This case also shows impaction of the third mandibular molar.

(2) Inclinations of different kinds are fairly common. One interesting case shows a mandibular first permanent molar inclined medially across a retained deciduous molar, while the second premolar is completely displaced lingually

Fig. 14.—Lingual displacement of mandibular incisors, and impaction of third molar.

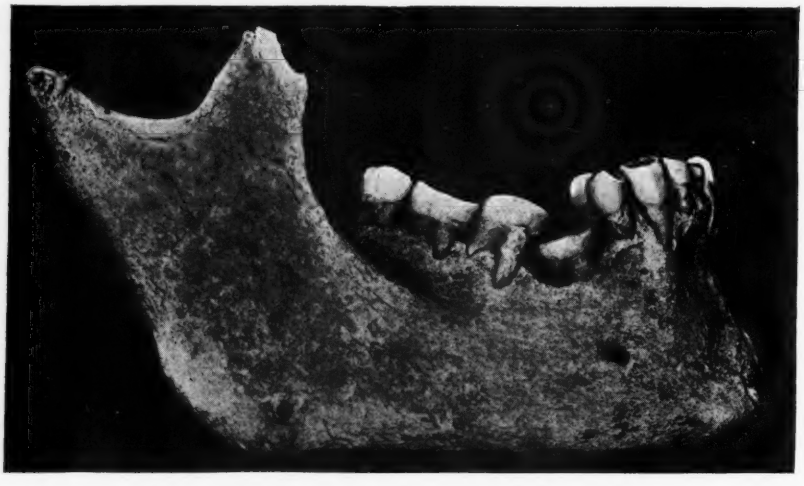


Fig. 15.—Medial inclination of mandibular first permanent molar across retained second deciduous molar. Displacement of second premolar.

(Fig. 15). This specimen also shows a good example of caries (of which there are five other cases). It is one of two cases of retention of deciduous teeth. The right maxillary first deciduous molar of this case is also present, much worn. The other is the case of misplaced permanent canines already shown, where the right deciduous canine is still in position.

(3) Rotation is extremely common, especially of maxillary molars and mandibular incisors. Fig. 16 shows a mediolabial rotation of a second permanent

molar after the loss of the first permanent molar—the reverse of the usual direction of rotation. This specimen is the one in which the first maxillary deciduous molar is retained.

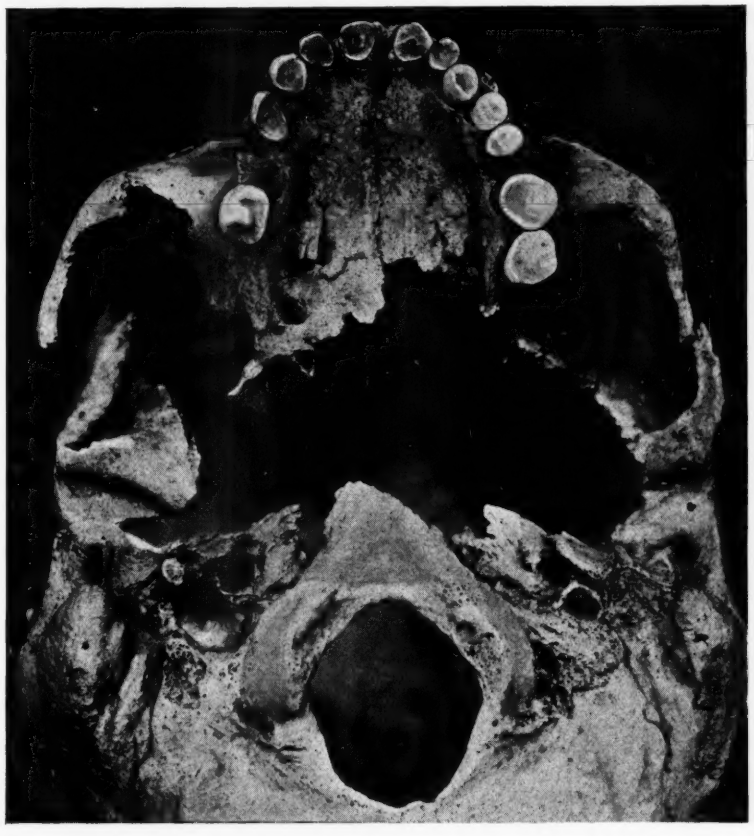


Fig. 16.—Maxilla of specimen in Fig. 15, showing retained right first deciduous molar, and mediolabial rotation of left second permanent molar after loss of first permanent molar.

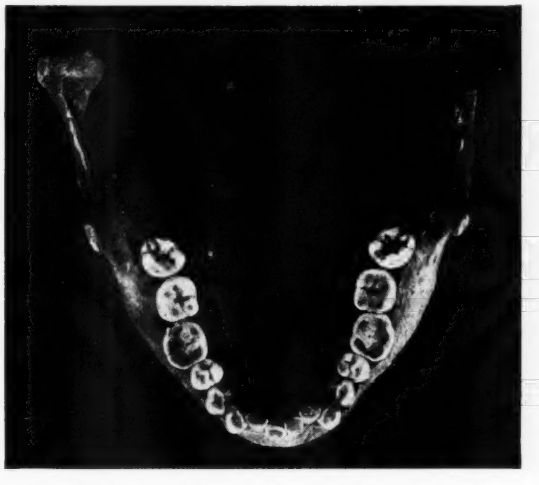


Fig. 17.—Imbrication of mandibular incisors. (Illustration by courtesy of the Dental Board.)

(4) Imbrication: Imbrication of mandibular incisors is very common indeed—about thirteen cases (Fig. 17).

(5) Separation is very well marked in one case (Fig. 18). There appears to have been no supernumerary or supplemental tooth in this, or in any other case. Another case shows slight spacing both medial and distal to the maxillary canines, the arches being particularly well developed, and there are three cases with slightly spaced maxillary incisors.

Congenital absence of teeth. This is not a common condition, but there appears to be no premolar above the retained first deciduous molar, shown in Fig. 16, and in one or two cases mandibular third molars appear to be absent, but this has not yet been verified by radiographs.

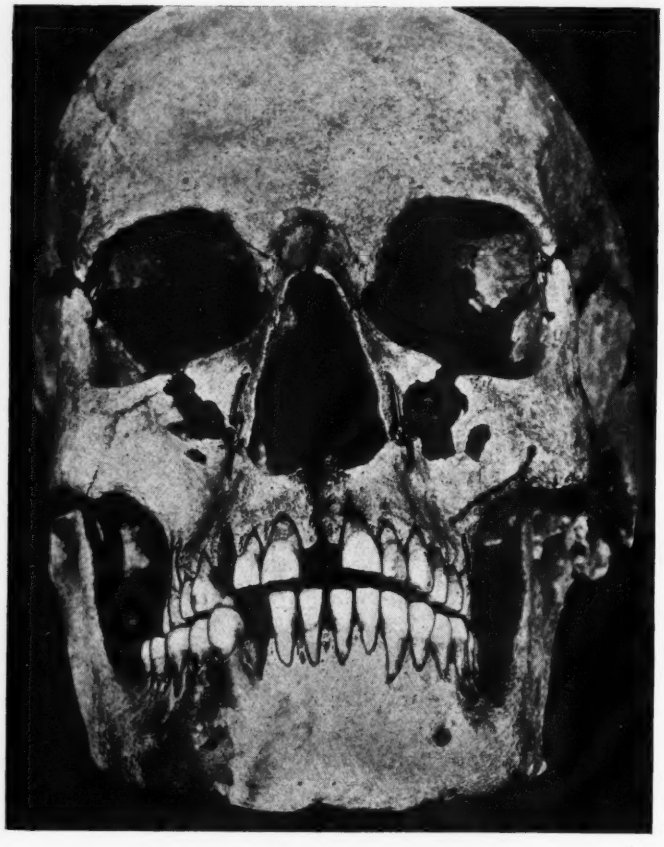


Fig. 18.—Separation of incisors.

Abnormalities of shape or size of teeth are fairly common; ten cases occur. The majority of them are teeth too small in proportion to the rest of the dentition, or with a reduced number of cusps; two cases are maxillary second premolars (Fig. 8), three are molars which have a cusp less than normal. The abnormality occurs in pairs of teeth in most cases. One case has the second and third maxillary molars on both sides distorted in shape; they are flattened mediodistally and broad buccolingually (Fig. 19). Two or three molars have an additional cusp.

Hypoplasia occurs in two or three cases, to a slight degree. One tooth has a peculiar invagination of enamel.

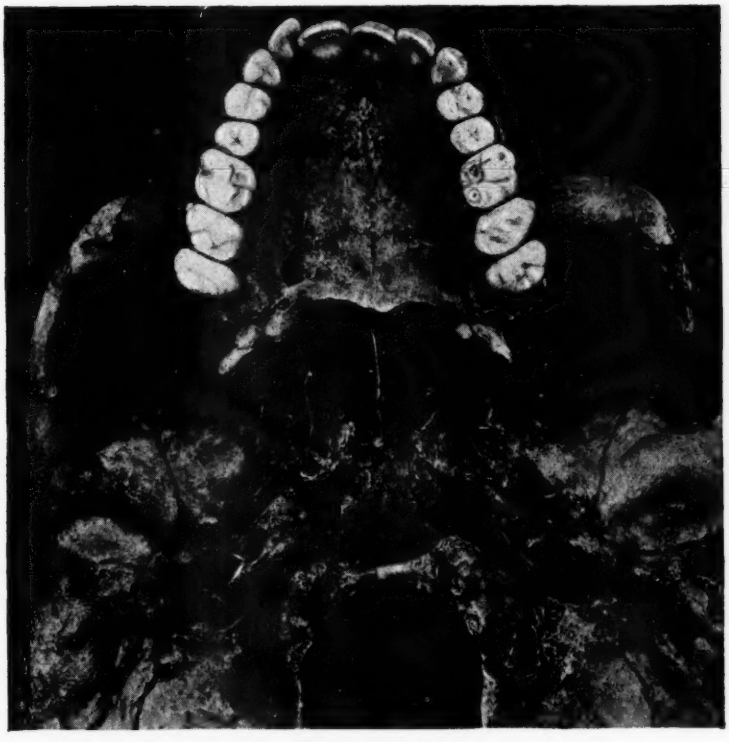


Fig. 19.—Abnormality in shape of molars.

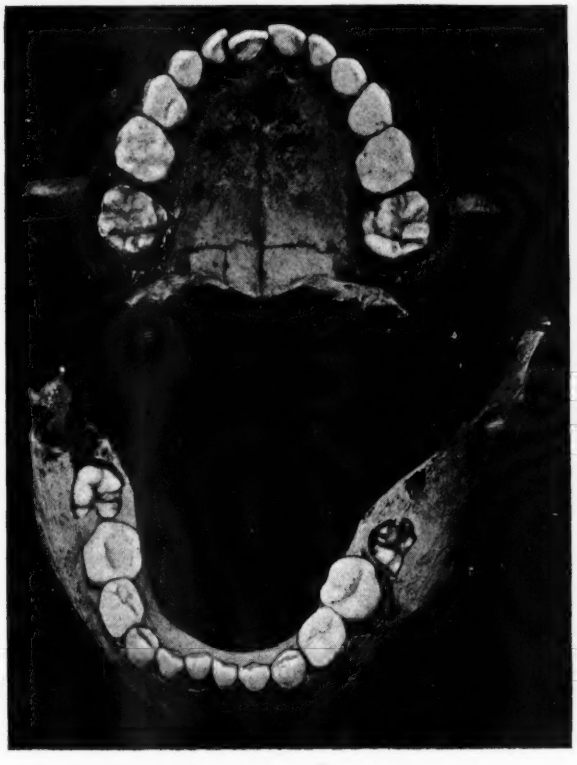


Fig. 20.—Irregularity of deciduous incisors.

Tartar occurs rarely also, three or four cases being affected.

Caries, as has been said, occurs in only six cases out of thirty-nine. In one case there is a large abscess cavity in the bone.

Necrosis occurs in one mandible, and is very extensive. This case shows exostosis of the roots of the teeth involved in the necrosis, and also of one maxillary molar.

Apart from the thirty-nine specimens already described, there is a collection of maxillas, mandibles, and fragments, belonging to quite young children. Unfortunately, hardly any of them can be put into occlusion, and many are incomplete. But thirteen specimens were considered fit for classifying for ir-

Fig. 21.—Skull of child about six years of age, with normal occlusion of first permanent molars.

regularities of individual teeth, and general observations. No fewer than seven of these show rotations and imbrications of deciduous or erupting permanent teeth (Fig. 20).

Spacing and wear of deciduous teeth seem to occur later than we consider to be normal. Several specimens in which the permanent molars are about to erupt show little or none of either physiologic process. Only two specimens show very marked wear, and both these have the first permanent molars erupted.

One specimen in which occlusion can be ascertained, shows an interesting stage of development. The first permanent molars have just come into occlusion, in a perfectly normal manner (Fig. 21). It can be seen that the deciduous molars are worn, and that the mandibular teeth have moved forward in advance of their original relationship with the maxillary teeth. Another interesting

point is the presence of an extra cusp, placed distally, on the second maxillary deciduous molar. This cusp appears to be helping to keep the maxillary permanent molar back. The relationship of the anterior teeth cannot be ascertained, as the teeth are wrongly stuck into place.

In conclusion, I should like to mention briefly another collection of skulls of very similar date to the one ascribed to the Bidford find. This is the Dunstable collection at University College, which I have examined with the kind permission of Professor Elliott Smith. Time does not permit a description of these skulls here, and it is intended to describe them on a separate occasion, but it is interesting to note that malocclusion is also found in quite a number of these specimens. One remarkable point is the number of cases in which third molars are completely absent, as confirmed by radiographs. Another point of interest is, that although irregularity of the mandibular anterior teeth is fairly common, it usually takes a different form from the imbrication of incisors which is so common among the Bidford skulls. The characteristic irregularity of the Dunstable mandibles is an imbrication of the canines over the lateral incisors. This is sometimes accompanied by a marked medial inclination of the canines.

Dr. Matthew Young has written a full description of a skull of the Dunstable collection which he considers to be a representative male specimen.[5]

I should like to acknowledge with thanks the use of notes made by Dr. Friel upon some of the Bidford specimens, and to thank Professor Brash in particular for his valuable help and the loan of some photographs which have appeared in his book.[1] My thanks are also due to Professor Lockhart of Birmingham, who kindly gave me all facilities for the preparation of most of the photographs, which were taken by Benards and Company.

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DISCUSSION

Dr. G. Northcroft remarked that Professor Brash, in his preliminary communication, had referred to a paper by Mr. John Humphreys. The paper was read when the society was still at Chandos Street. Mr. Humphreys had given him an opportunity of x-raying some of the deciduous dentitions which he had brought up to London; to his surprise he had found evidence of the absence of mandibular second premolars and specimens of almost every type of irregularity known to modern orthodontists.

Mrs. R. Lindsay inquired of Miss Smyth whether the marked separation of the teeth and the extraordinary stalwartness of the bone of the jaw in skull No. 197 did not suggest some increase in the growth of the mandible, possibly due to the enlargement of the tongue. She possessed a denture at Russell Square of an Irishwoman of forty-five years of age with a complete dentition; the teeth of the mandible were much separated and the same open-bite

was present in front. She considered that the same condition might be the cause of the anomalies in the Saxon skull. A friend of hers had been consulted by a patient from New Zealand with the same condition, due to enlargement of the tongue.

Dr. S. Friel declared that Mr. Humphreys' paper had been read in 1924 when he had been president.

Mr. Wilson Charles remarked that it had become almost the correct thing to say that the tendency of the modern jaw to be narrow was the result of diet and of changing habit. He had been asked to examine the collection of skulls in the Royal College of Surgeons, in order to ascertain whether the third molar was missing or impacted to the same extent as it was today. He was, unfortunately, unable to produce figures, but he had found that the third molar was missing to an enormous extent. There did not appear to be any definite evidence that the narrowing of the jaw which was supposed to have taken place in modern times was due to diet or to change of habit. Sir Arthur Keith, in a discussion on a paper read by Mr. Dudley Buxton before this society in or about 1920, had said that the skulls of the Bronze period showed definite edge-to-edge bite with some overlap of the incisors; that the skulls of the Roman period very often exhibited marked overlap, and the skulls of the Saxon period strong edge-to-edge bite, while in the Middle Ages, by the time of Elizabeth, we had gone back to the overlapping bite. In living primitive races at the present day—in certain African tribes, for example—it was possible to see the strongly developed jaw, the typical jaw which our forbears were supposed to have, while in another tribe, living side by side under somewhat similar conditions, but on a different diet, a narrower type of jaw was observed. One could only conclude that the question of diet had not been conclusively answered. When it was desired to produce a change in the form of a species of animals, the change was brought about by cross-breeding—i.e., by a change of environment and not of diet. It was fairly evident that the old case was not proved. The statistics which Miss Smyth had brought before the society showed conclusively that the present malocclusion, while it might be more marked, was only more obvious because observers had been trained to see it. These skulls had been examined by anatomists, and, while he had the greatest respect for anatomists and did not mean to convey any unkind meaning, he thought that they would be the first to acknowledge that they were not competent to examine teeth for malocclusion in the same way as the trained orthodontist. The meeting had seen that in this one collection of skulls there existed almost every irregularity that was present in modern skulls. His own investigation into the skulls at the Royal College of Surgeons showed that somewhat similar conditions existed: the teeth were missing, especially the third molars, first molars and lateral incisors; teeth were impacted, and there was every degree of malocclusion. He congratulated Miss Smyth on her paper, and thanked her for bringing forward evidence to show that present-day malocclusion of the teeth was no new thing but something that dated back to the very earliest times.

Mrs. Lindsay said that Mr. Charles had brought up a point which needed correction. Most orthodontists present would remember Dr. Waugh's paper read at the Second Orthodontic Congress, on the Eskimos showing that owing to diet the jaws had degenerated in two generations into every form of malocclusion and caries. She had seen the paper again in Chicago and refreshed her memory. She had been astounded by the evidence of the models of grandfathers, fathers, children, and grandchildren for every kind of malocclusion and crowding, V-shaped arches, postnormal occlusion and caries in modern Eskimos who had gone to the coast and lived on modern tinned food, carbohydrates and soft food. The children in the primitive state had retained their primitive jaws and good arches.

The *President*, in thanking Miss Smyth on behalf of the society, suggested that the deciduous molar had persisted owing to nonabsorption of the roots due to sepsis; it had occupied space belonging of right to the second premolar, which had been pushed into the palate. The first molar had fallen forward owing to the subsequent eruption of the second molar. This accounted for the overhang of the first molar. He had been, he said, much

struck by the tremendous attrition of the teeth, which he supposed to be due to the hard diet. A number of teeth he had seen lately had suffered in the same way, being worn right down to the gum through chewing tobacco until there had been no enamel left, and the attrition had continued right into the pulp space and the secondary dentin. It was satisfying to think that the third molar had been absent in those days, together with lateral incisors and premolars. He had seen a patient with congenital absence of six teeth: two maxillary lateral incisors and four premolars, symmetrically. The patient had otherwise been quite normal. He understood that there was an increasing absence of lateral incisors and third molars. He thought there was a school in London which taught the existence of two and a half molars a side, and predicted that in the future the race would have two molars, two canines, two central incisors, no lateral incisors, no premolars to each jaw, a small mouth, and a large forehead.

Mr. Steadman asked whether the attrition, which was so very marked and interesting, was not due to sand in the food. In the war, he related he had served on the Sinai Desert and while there had examined many animal skulls. The teeth had often been worn down by attrition in much the same way. He had sent several specimens home to the museum of the Royal College of Surgeons. He had not been able to examine the teeth of many natives, but those he had examined had shown attrition. Living on food cooked in the desert by the orderlies, it had been impossible to avoid eating sand; every mouthful had given a gritty feeling, and many members of the unit had begun to suffer from worn-down cusps. He did not know whether the climate of England had altered since the seventh century.

The *President* suggested that the Saxons had milled their wheat with stone rollers and that grit had got into the bread.

Miss Smyth, in reply, said that her own impression of the date of Mr. Humphreys' communication was that it had been delivered in 1924. She had a very dim recollection of it, and had joined the society at the end of 1923. She said that she would be very interested to see Dr. Northcroft's x-ray pictures as she had not radiographed the Bidford specimens. She had not any means of ascertaining what conditions had prevailed in the owner of the skull upon which Mrs. Lindsay had commented, but considered that he had very probably suffered from enlarged tongue. She had seen cases, particularly in the mandibular arch of mouth-breathers, where the tongue dropped to the floor of the mouth, making the mandibular arch wide and leaving the maxillary arch without its normal stimulus to growth. She could not feel sure that the specimen to which Mrs. Lindsay referred was a case with open-bite. Some of the molars had been incorrectly stuck in and she had not dared to alter their position, and so had not been able to put the mandible in correct relation with the maxilla. Otherwise, she thought, it would have been an ordinary case of edge-to-edge occlusion. The teeth had all been worn down, and if it had been a case of open-bite there would not have been so much wear of the incisors. She remembered Dr. Waugh's paper with great interest, especially on the point of diet in relation to attrition. The whole subject of attrition seemed to be bound up with diet. She proposed to inquire into it, and begged for enlightenment on the diet in use at different periods of history. She had no idea of the diet of the Anglo-Saxons whose skulls she had examined, but during the discussion it had occurred to her that there might be a difference in the type of the attrition of the Eskimos and the Anglo-Saxons. Mr. Steadman had definitely been able to trace it to the sand in the food. With the Eskimos grit did not seem to be a factor, but the attrition was more probably caused by tremendous muscular action on very tough foodstuffs. A different kind of attrition would be produced from that of sand; little muscular movement would be necessary to wear teeth down if the food contained grit, but a tough substance, like chewing gum, would require very strong muscular action. Miss Smyth expressed great interest in Mr. Charles's investigation, and asked whether he knew of any other collections of skulls in which overlap of maxillary incisors, impaction, absence of teeth, and irregularities were all represented. Professor Brash, one of the most famous anatomists in the country, would be the first to

say that he did not consider himself or any other anatomist qualified to make detailed observations on occlusion, and would always call in a dental surgeon to do it for him. Concerning the President's remarks on the deciduous molar, she considered that the explanation was a likely one. Her observations and those of Mr. Charles pointed to the third molar being less frequently absent than it had been in ancient days. The number of cases of absent molar in the Dunstable collection was surprising: eight or ten cases of absence of both mandibular or both maxillary molars, or one of each in thirty or forty skulls. She doubted whether in a group of persons nowadays one would find as many as ten cases of absence of both molars. She had found no cases of absence of laterals.

The meeting passed a hearty vote of thanks to Miss Smyth for her paper.

THE CRISIS IN ORTHODONTIA*

PART I

3. CRITICAL REVIEW OF THE PUBLICATIONS ON ORTHODONTIA BY B. GOTTLIEB, B. ORBAN, A. M. SCHWARZ, AND J. A. MARSHALL†

ALBIN OPPENHEIM, VIENNA, AUSTRIA

(Continued from page 55, January)

In the publications of Schwarz we find, besides the transgressions against my writings, still other violations of a principle of every earnest scientific work, namely, that facts laid down in literature must be quoted true to the original.

It is, for instance, not admissible that a picture of a maxillary molar reproduced in Gottlieb and Orban's work be converted into a mandibular molar by Schwarz and that in the identical picture the direction of force, indicated by an arrow, be turned around 90 degrees. In Fig. 10 on the left side is reproduced the original Fig. 58 of Gottlieb and Orban, and on the right side the Fig. 8 of Schwarz (INTERNAT. J. ORTH. **18**: 338, 1932). That this is no mistake of the printer's is evident by the fact that this picture is reproduced in the same and incorrect way in the *Fortschr. d. Orthodontik.* (1931, p. 398); while this picture in the original is described as "apical region of the upper distal root on the right maxillary molar," the description of the same picture in the reproduction by Schwarz reads as follows (INTERNAT. J. ORTH. **18**: 338, 1932): ". . . the osteophytes were formed on the outer surface of the mandible near the apex of a tooth which was pressed in the direction of the arrow."

The same picture (Fig. 58, Gottlieb and Orban) is also reproduced in the "critical review" of Bodecker (INTERNAT. J. ORTH. **18**: 910, 1932) but, of course, correctly as a maxillary molar with the direction of the arrow conforming to the original.

Also Schwarz's reference to the material of Gottlieb and Orban as a source for clearing up the etiology of root resorption is incorrect, because in all Gottlieb and Orban's material the apex is reproduced in only 20 cases, and of these only 3 show very slight resorptions of the cementum, which has nothing to do with a genuine root resorption. As an example, the apex of the tooth that was used in the experiment for the longest time (thirteen months) is reproduced (Fig. 11; Gottlieb and Orban, Fig. 145). This condition can by no means be compared to the extensive root resorption as shown by Ketcham and others.

*From the Department of Orthodontia of the Dental Institute of the University of Vienna.

†Translated in abbreviated form from *Ztschr. F. Stomat,* Supplement to No. 22, November, 1933, published by Urban & Schwarzenberg, Vienna and Berlin.

Schwarz's reference to the material of Gottlieb and Orban's is not valid for the reason that, as already mentioned, the only positive information that this material can give to orthodontia is the *realization that even the strongest intermittent forces are not able to produce genuine root resorption.*

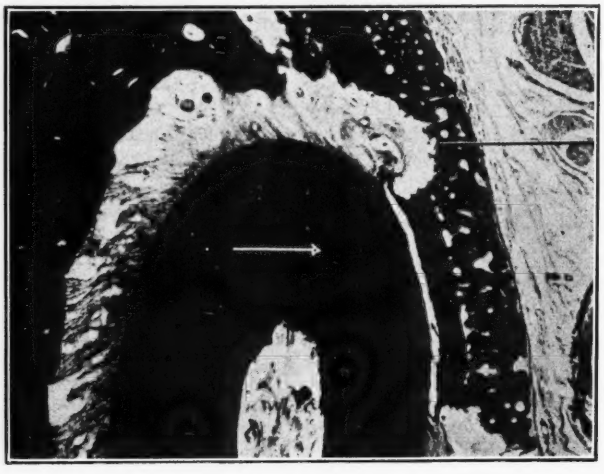


Fig. 10 *A*.

Fig. 10 *B*.

Fig. 10.—Misrepresentation of a histologic picture of Gottlieb and Orban by Schwarz:
***A*, Gottlieb and Orban (Fig. 58): "apex of the right upper distal root."**
***B*, Schwarz (INTERNAT. J. ORTH., 1932, p. 338, Fig. 8 *A*): "Influence of a strong force in the direction of the arrow"; and the text (p. 338): "osteophytes were formed on the outer surface of the mandible . . ."**

Also the experiments of Sandstedt, conducted with strong intermittent forces of the screw, were not able to bring about a genuine root resorption.

We are thus confronted with this unusual situation: all the material of Gottlieb and Orban's does not show *one* extensive root resorption which would compare to Ketcham's clinical findings; this should convince me, as well as

any other objective reader, that the action of even the strongest intermittent forces of longest duration cannot create a genuine root resorption; yet this same material serves Schwarz as the basis for the formulation of a root resorption theory.

In further publications of Schwarz we find: (1) definite statements, sometimes with an attempted theoretic justification or an explanation by schematic drawings, which are not verified by any proof whatever; (2) the theoretic postulate for "biology" often disregarded by the practical application; (3) defense and recommendation of methods for treatment by reference to publications supposedly supporting this recommendation; and (4) enunciations of precise dogmatic nature which are contradicted by enunciations on the same subject of the same dogmatic nature published elsewhere.

(1) For Schwarz's statements regarding the utility of the Skogsborg operation (septotomy) no proof whatever is given (INTERNAT. J. ORTH. **20:**

Fig. 11.—Gottlieb and Orban (Fig. 145). Duration of experiment was thirteen months: "Repaired slight tooth resorption."

766, 1934). His statements concerning the significance of sleeping habits as an important etiologic factor in creating malocclusions were disproved by Mansbach* by a careful check-up on sixty-three children of Schwarz's experiments.

Schwarz's experiments and sketches concerning the position of the fulcrum in tilting movement and the conclusions drawn therefrom were refuted by Bauer) "the experiments are more than primitive"), Häupl ("the experiments cannot give any explanation of the biologic procedure," and "they must be valued with great caution because the conditions in the mouth do not correspond in any way to the conditions used in the experiments"), and by me (INTERNAT. J. ORTH. **20:** 252, 1934).

Schwarz states that in vivo "the crest of the alveolus receives no pressure even under strong lateral pressure" (Dental Items of Interest **52:** 107, 1930), "but that the compressed area had its maximum not at the crest of

*Mansbach, Margot: Über den Einfluss von Schlaflagen auf die Entstehung von Kieferanomalien, Ztschr. f. Stomat. **29:** 1331, 1931.

the alveolus, but quite a distance below it'' (Dental Items of Interest, p. 106). Gottlieb and Orban come to the opposite conclusion from that of Schwarz (Gottlieb and Orban, p. 219): ''Only one kind of permanent injury could be ascertained in our experiments, namely, the destruction of the bone at the alveolar margin in the use of lateral pressure. . . . This implies without doubt a permanent damage.''

This fact ascertained by Gottlieb and Orban is demonstrated in the large amount of material of these authors. In all cases the destruction is found at the crest of the alveolus.

(To be continued.)

Special Article

CONCERNING THE REORGANIZATION OF THE AMERICAN SOCIETY OF ORTHODONTISTS*

L. M. WAUGH, D.D.S., F.A.C.D., NEW YORK, N. Y.

IN THE affairs of our Society, this is a time for careful thought and a time when *wise* leadership is much needed. The term "new deal" is spoken of in the press and is in the minds of legislators and of the people of our nation. Just what this will mean, I presume no one now knows, and yet I dare say the majority of citizens seem to be for it. Much is being said of governmental control of industry and of subsidizing certain groups of workers, at least in part. In this period of revision, it is but natural that so important a function in human welfare as the *health* services should receive consideration, for good health is a fundamental asset of the nation and of the world. Considerable has been said and written about some form of group and socialized medicine, surgery, and dentistry which includes orthodontics, and much more is undoubtedly to come. It is, indeed, a time for us to study seriously the problem as it confronts our specialty so that we may be prepared to offer *wise counsel* and give proper guidance for the best interest of all concerned which includes all of the people, rich, middle class and poor alike, and it must of necessity include the welfare of the practitioner and those dependent upon him. But we have faith in the outcome provided we work together and make a sincere, concerted effort to shape a policy and offer wise guidance which shall be for the welfare of all concerned.

In orthodontics, this should surely come from the orthodontists, and this, the leading society of orthodontists in the world should be foreseeing enough to weigh the problem carefully and determine a wise general policy. To this end, your officers conferred among themselves and with quite a number of the members of the Society present. I should like to review very briefly some of the salient considerations in explanation of resolutions I shall offer for your consideration, and I hope endorsement.

After careful conference by the officers with quite a number of the members from various parts of the United States and Canada, we came to feel, I think, that the next annual meeting would best be held April, 1935, for the following reasons: (1) it will give more time for national recovery; (2) by holding only two meetings in three years, it will be possible, without weakening the treasury, to remit the dues for one year. This seems to me most important, as about one-fourth of our members are in arrears. About thirty of these, the treasurer reports, will according to our By-laws, have to be dropped automatically after this meeting for nonpayment of dues, unless this is done. Among

*Remarks made by L. M. Waugh in the Executive Session of the American Society of Orthodontists, Oklahoma City, November 7, 1933.

these would be a number of former officers including some past presidents, and this would, it seems to me, be little short of disrespect. They are fellow members and fellow practitioners whom we know and respect and who have had the welfare of this Society at heart and worked for it before many of us became members. Their unfortunate condition is the result of no fault of their own, but is due to changed national and world conditions which have made themselves felt much more in some parts of our country than in others. It is only temporary, for conditions are improving, and with a year in which to catch up, they will undoubtedly be in good standing. Giving you my personal reaction, I can see no need for increasing our treasury at this time, since it will hold ample reserve when outstanding dues are paid in. If we decide to have only two meetings in three years, then there will be the expense of only two meetings and the payment of two annual dues will leave our treasury equally strong, since the cost of meetings is our principal expense.* The second advantage in holding the next meeting in April, 1935, concerns the program. It is only natural, and I am sure you will approve of the ambition of our officers, to provide an excellent program, one that will measure up to the superior quality of that for the Oklahoma City meeting, and the best of years past. Six months would be almost too short a time to be assured of this. To bring the question before you for discussion, I offer the following resolution:

"That the next annual meeting be held in the spring of 1935."

[Resolution unanimously adopted.]

Now that this resolution has been adopted, I should like to bring before you for consideration another phase of this same general condition. It has to do with the manner in which our Society is organized. I spoke of this at some length at the business meeting in 1932 when we were discussing the proposed change in By-laws, and referred to it briefly at the meeting in 1931. It is not original, although it has been growing upon me for the past eight or ten years. I refer to the reorganization of the Society so as to place it on a *national* and perhaps an *international* basis. Dr. Clinton Howard mentioned this in his president's address, and Dr. Delabarre also spoke of it in his address to the New York Society of Orthodontists. The American Society of Orthodontists is an independent organization, covering the United States and Canada. It has no relationship to any other body of orthodontists. There is one regular meeting a year. There are also quite a number of sectional or regional orthodontic societies, each independent of the others. There is lacking a uniformity in membership standard for the various sections. In some, it is two years of exclusive specialization, and in others only one, and still others the requirement for admission is three years. There are, today, applications before the Board of Censors for admission to the American Society of Orthodontists of men who are not members of their local society, some being from men who have been rejected by the local society and who are defiantly trying to triumph over local colleagues

*The treasurer, Dr. Claude R. Wood, reports, under date of January 25, 1935, that of the ninety members in arrears at the last annual meeting, only twelve have failed to remit, and he is sanguine that some of these will pay before the next meeting.

With favorable action on the applications that have passed the Board of Censors, the paid-up membership will be larger than at any time in the history of the Society. In addition, the District Societies report goodly numbers of applications for active membership as proposed in the reorganization plan. This will further increase the membership.

by being accepted directly into the American Society of Orthodontists. This unfortunate condition would be entirely obviated were we organized on a national basis, for members would first have to be voted into the regional or sectional society, and this being a component part of the national organization, each one of its *active* members would also become a member of the American Society of Orthodontists.

Then, too, there are some misnamed orthodontic societies, the members of which are not specialists but are deceiving the public by posing as such, and are obtaining publicity for their members for the direct purpose of obtaining patients. This form of deception could be more effectively dealt with were all recognized local societies component parts of the national body and a uniform policy adopted.

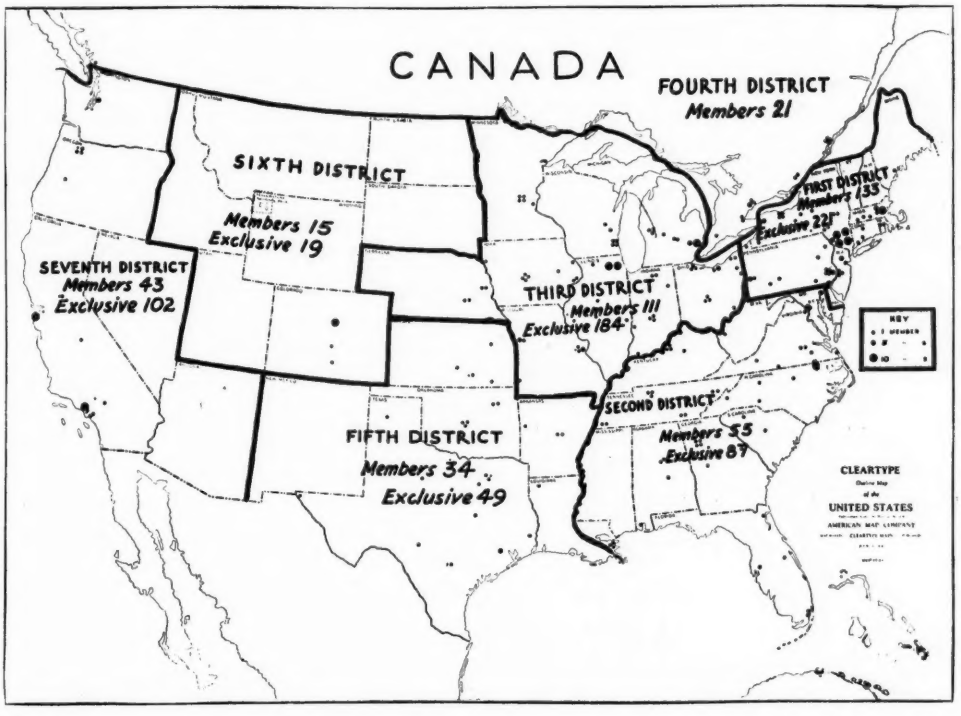


Fig. 1.—Showing the seven districts of the United States and Canada as finally voted by the various regional societies. Members in strictly borderline states may choose in which one of the two adjacent districts voting membership is preferred. He pays his dues to the American Association of Orthodontists and has the privilege of voting and holding office. He may, however, join as many other district societies as he wishes and shall pay only the district dues and shall have all privileges except that of voting and holding office.

Just as this goes to press the Chairman of the Reorganization Committee informs me that the Great Lakes and the Chicago Associations have agreed to the suggestion of a division of the Third District as it is shown in this map. By this change, the states of Ohio, Michigan, and Indiana will form the new Third District; and the states of Illinois, Wisconsin, Minnesota, Iowa, Nebraska, and Missouri will form the Fifth District. This, he feels, will facilitate a continuance of the individuality of each association. It necessitates the renumbering of districts as shown in the above map as follows: The Fifth, Sixth, and Seventh Districts will become the Sixth, Seventh, and Eighth, respectively.

The membership of the American Society of Orthodontists would be considerably increased, as there are a surprising number of members in some sectional societies who do not belong to the American Society of Orthodontists. For the individual member, there would be a material saving since there is considerable duplication of expense. In the reorganization plan, all the dues would be

paid to the district treasurer, who would retain the amount needed by the district society and forward the balance to the treasurer of the American Society of Orthodontists. Thus the sectional societies could individually decide on the amount needed and add this to the amount due the American Society of Orthodontists. Looking to further saving for our members, we have discussed the matter of subscription to the official journal with the publisher and after considering the problem from all angles, he is ready because of economies possible and the increased number of subscriptions when all of our members receive the Journal, to supply it through en bloc subscription at a rate that will permit including it in the dues. For example, a number of our officers have figured it out thus: The dues to the American Society of Orthodontists now are $10.00, the subscription to the Journal is $7.00 and the dues to most sectional societies are $10.00, making a total of $27.00 per year. By the reorganization plan, with the increased membership in the American Society of Orthodontists, the Society, our treasurer estimates, could operate on about $10.00 per year including the Journal; and if the economies in local society expenditures could be covered by dues of $5.00, making a total of $15.00 per year including the Journal, there would be effected a saving of $12.00 per year per member, and many thousands each alternate year in travel and hotel expense of attending the meeting of the American Society of Orthodontists.

This may possibly seem a little too optimistic to some, but to all I hope the possibility both of economy and of efficiency will be apparent.

Before offering a resolution bearing on this, may I assure you that I have no pet theory or set plan to urge upon you. I shall hope only to bring this whole problem before you through a well-chosen joint committee representing all the recognized regional societies, and their conclusions will be presented for consideration and vote at the next meeting. To bring this formally before you, I desire to offer the following resolution:

> "That the President be empowered to appoint a committee on reorganization of the American Society of Orthodontists whose duty it shall be to inform the generally recognized sectional or regional societies and obtain their majority opinion of the proposal, and to prepare a plan for national reorganization to be presented for discussion and vote at our next annual meeting."

[Resolution unanimously adopted.]

The following Joint Committee was appointed:

REORGANIZATION—JOINT COMMITTEE*

American Society of Orthodontists	Pacific Coast Society of Orthodontists
W. E. Flesher, *Chairman* Medical Arts Bldg., Oklahoma City, Okla.	John D. McCoy, *Chairman* 3839 Wilshire Blvd., Los Angeles, Calif.
Charles R. Baker, 636 Church St., Evanston, Ill.	A. E. Scott, 135 Stockton St., San Francisco, Calif.

*L. M. Waugh, General Chairman, 576 Fifth Ave., New York, N. Y.

CHICAGO ASSOCIATION OF ORTHODONTISTS

J. W. FORD, *Chairman*
55 East Washington St.,
Chicago, Ill.

HAROLD J. NOYES,
30 North Michigan Ave.,
Chicago, Ill.

GREAT LAKES ASSOCIATION OF ORTHODONTISTS

ERNEST N. BACH, *Chairman*
Second Nat. Bank Bldg.,
Toledo, Ohio

FRANK M. CASTO,
Keith Bldg.,
Cleveland, Ohio

NEW YORK SOCIETY OF ORTHODONTISTS

HARRY E. KELSEY, *Chairman*
833 Park Ave.,
Baltimore, Md.

FRANK A. DELABARRE,
520 Beacon St.,
Boston, Mass.

ROCKY MOUNTAIN SOCIETY OF ORTHODONTISTS

W. R. HUMPHREY, *Chairman*
1232 Republic Bldg.,
Denver, Colo.

OLIVER H. DEVITT,
523 Republic Bldg.,
Denver, Colo.

SOUTHERN SOCIETY OF ORTHODONTISTS

C. C. HOWARD, *Chairman*
Doctors Bldg.,
Atlanta, Ga.

OREN A. OLIVER,
1101 Medical Arts Bldg.,
Nashville, Tenn.

SOUTHWESTERN SOCIETY OF ORTHODONTISTS

T. W. SORRELLS, *Chairman*
907 Medical Arts Bldg.,
Oklahoma City, Okla.

BROOKS BELL, JR.,
Medical Arts Bldg.,
Dallas, Texas

The members of this committee have, at the meetings of their respective regional societies, presented the proposal and, after much earnest effort, desire to report the following:

All the regional committeemen have approved the districts as shown in the accompanying map (Fig. 1), and all the districts have voted endorsement except the Southern, which has not as yet reported; but I am assured by Drs. Howard and Oliver of the committee and Dr. Claude R. Wood, Secretary-Treasurer, that practically all of the members of the American Society of Orthodontists residing in the district will vote for it.

May I invite your careful study and constructive criticism of the following tentative report of the Joint Committee on Reorganization.

BRIEF SUMMARY OF SUGGESTIONS FOR CHANGES IN THE CONSTITUTION AND BY-LAWS IN CONJUNCTION WITH REORGANIZATION ON A NATIONAL BASIS

L. M. WAUGH, CHAIRMAN

I. *Names.*—The name shall be the American Association of Orthodontists.

The term "Society" shall be applied to the districts, e.g., First (Second, etc.) District Society of the American Association of Orthodontists.

The names of component societies within the districts shall be of local choice. For new ones, it is hoped the names of the respective states, counties or cities will be chosen.

II. *Representation and Vote.*—Representation and vote in the American Association of Orthodontists shall be by delegate except in the election of officers, who shall be chosen by mail ballot.

All *Active* members in good standing shall have the right to take part in all executive sessions in every way but to vote. Voting shall be by delegate. There shall be one delegate and one alternate for every twenty-five active members or major fraction thereof in every

district. The delegate shall cast a vote for the district, or, in his absence, the alternate shall cast the vote. Should the active membership in any district drop below the major fraction of twenty-five—which minimum major fraction is thirteen—the district shall have one vote. Should both the delegate and the alternate be unable to attend, the president of the district may appoint a voting substitute.

III. *Classes of Membership.—*

In the American Association of Orthodontists: (a) Active, (b) Honorary, (c) Service Members (Army Dental Corps, Navy Dental Corps, and the Dental Corps U. S. Public Health Service). The Service members shall be so designated in the By-laws. (d) Affiliated members (members of recognized foreign organizations of orthodontists in good standing) shall be accepted into *Affiliated* membership in the American Association of Orthodontists; also practitioners, teachers, and scientists working in co-lateral fields shall be eligible for affiliated membership in the American Association of Orthodontists. They shall have all the privileges except those of voting and holding office. They shall pay no dues except the cost of the official publication of the Association.

Every *Active* member shall on joining the district society, sign a pledge to adhere zealously to the code of ethics of the Association and shall further pledge himself to resign and return the certificate of membership should he do otherwise. If eligible, he may continue in the district society as an associate or an allied member. Eligibility for *Active* membership in the district societies shall require a minimum of three years in the exclusive practice of orthodontics.

In the District Societies: The membership shall consist of (a) active, (b) associate, (c) allied, provided the district society so decides by a majority vote of the members of the respective district. Any district may reject the Allied class of membership by majority vote without affecting the other districts.

(a) *Active* membership shall be based on a minimum of three years in the exclusive practice of orthodontics. These are the only district members eligible to membership in the American Association of Orthodontists.

(b) *Associate* membership shall be based on a minimum of one year in the exclusive practice of orthodontics, either in personal practice or with an active member, or serving whole time in a recognized orthodontic clinic, or as a teacher of orthodontics, or as a research scholar in an acceptable department of orthodontics in a recognized school. Associate members may be eligible to elevation to active membership after three years in exclusive practice, or as a whole-time teacher, or as a research worker in orthodontics upon presentation of an acceptable scientific contribution, or of certification by the American Board of Orthodontists. They shall have all the privileges except that of voting and holding office.

(c) *Allied* membership shall include (1) recent graduates from recognized departments of orthodontics while they are establishing themselves in special practice, (2) dentists whose practices are devoted to a minimum of 50 per cent of orthodontics, the remainder to dentistry in practice, teaching or research. They shall have all the privileges except that of voting and holding office.

The *dues* for Active, Associate and Allied members shall be the same and shall include the official publication of the American Association of Orthodontists.

Active members shall receive an appropriate certificate of membership.

Fees and Dues.—The American Association of Orthodontists shall receive an application fee of fifteen dollars for each Active member. This shall be paid through the treasurer of the respective district. This shall include the dues for the remainder of the current fiscal year and shall include the official publication for this period. The amount of application fee for district membership shall be decided upon by each district, as also shall the amount of its annual dues and assessments.

The Joint Committee on Reorganization strongly recommends that the American Association of Orthodontists hold meetings biennially, for the following major reasons:

(a) Economy.—The dues can be reduced to ten dollars per year including the official publication of the Association, thereby effecting a saving of almost 50 per cent. All dues,

fees, and assessments shall be collected by the district treasurers and the amount due the secretary-treasurer of the American Association of Orthodontists be forwarded to him at designated times.

(b) The saving to members in travel and hotel expense on an estimated basis of two hundred members at fifty dollars each would aggregate, approximately, ten thousand dollars.

(c) Original contributions to the program of the high quality desired can be more easily obtained. With district and local societies holding an ever increasing number of meetings, there is greater difficulty in obtaining good program material for so many meetings.

It is important that sufficient flexibility be allowed, so that the various districts may function with contentment and efficiency. It is hoped, however, that they may decide to have their large meetings in the alternate years and contribute their best presentations to the following American Association of Orthodontists' program and have only an executive, and perhaps more or less social meeting in the year of the biennial meeting of the American Association of Orthodontists. This, however, is to be left to the preference of the sectional societies to be decided upon by majority vote at a stated meeting.

Districts have been voted by the regional societies as shown by the accompanying map. Members in strictly borderline states may choose with which one of the two adjacent districts voting membership is preferred. In this, he pays his dues to the American Association of Orthodontists and has the privilege of voting and holding office. He may, however, join as many other district societies as he wishes and shall pay only the district dues and shall have all privileges except that of voting and holding office.

Suggestions for improvement should be sent either to the Committee Chairman of your district, or direct to the General Chairman, L. M. Waugh, 576 Fifth Avenue, New York, N. Y.

The foregoing suggestions have been forwarded to the Committee on Constitution and By-laws, and have formed the basis for the proposed changes necessary to put the reorganization plan into operation. All members of the American Society of Orthodontists should carefully study the copy sent to them by Secretary Claude R. Wood, and should attend the executive session of the Annual Meeting, prepared for final discussion and vote.

Department of Dentistry for Children

THE HANDLING OF CHILDREN*

O. Henry, D.M.D., L.D.S., R.C.S., Eng., London, England

I FEEL that I must apologize for the personal element in this address, but I understood that I was to tell you how I work with children, and such a subject of necessity brings into the discussion the personal element, for a social situation exists between the dental surgeon and the child, and the material cannot be presented in the same impersonal manner which can be used in explaining the working of some new appliance.

The handling of children is technically the psychologic approach to children under conditions of tension and the subsequent direction of their interest in order to secure their cooperation, awaken their intelligence and establish harmony, thereby securing the successful outcome of dental treatment.

The physician and the dental surgeon are concerned with situations of physical pain, which can, by skillful handling, operate as valuable learning processes. It is of immense importance that the child cooperate cheerfully and actively, not only in order that the present treatment shall be successful, but also in order to develop and carry with him into adult life an appreciative attitude toward the value of good health and good teeth.

We can no longer use the authoritative Victorian attitude, for the modern child is a self-confident personage, and though it is easy to awaken his interest by the right mode of approach, he may resent an over-aggressive attitude, especially if we involve him in a situation in which he feels he does not receive the respect he deserves. He wants to be treated as a grown-up.

Now the great difficulty in our work with children lies in the fact that we do the same kind of work as for adults, without the children's understanding the necessity of having it done. We must, therefore, according to the age and intelligence of the child, either gain his confidence so that he will trust us blindly, or explain what we are doing in terms understandable and interesting to him.

In our approach, we must also remember that although most children are imbued with a sense of their own importance, they are shy with strangers, and, therefore, I have found it best not to greet a small child immediately on her entering the room, but first to approach the mother in a friendly manner, while the child is recovering herself and taking in her new surroundings. The child will then see that the situation is calm and natural and that there is nothing to be feared. Then, to get contact with the child, I ask the mother her name and make some flattering remark, while guiding the child to the chair, for instance complimenting the child on her name, saying: "Mary! What a pretty name!

*Read before the Dental Students' Society of the University College Hospital, London, Nov. 2, 1934.

I *do* like that name!'' and in general, trying to convey to the child that she has made a new friend, whose interest in her is personal rather than professional.

Now, a child's friend must appreciate a child's mind, that is, he must have an intimate understanding of a child's mental outlook and reasoning processes.

Once in the chair, most small children need very tactful handling, and are best surprised into opening their mouths by exclamations as to the astonishing number or beauty of their teeth, or some similar ruse, helped on by simulated excitement as to these discoveries on the part of the mother or my nurse. This is usually accomplished by first raising the upper lip slightly and saying admiringly: ''Look at the wonderful number of teeth,'' whereupon the child usually opens to show more of them, and then the routine examination can be made, while counting them slowly aloud to the nurse, saying: ''See, Nurse, there's another there! Why, that makes ten at the top!'' Thus, by a little strategy, the child is made to feel that his teeth and not himself, form the focus of attention, and, observing from aside, feels that the situation is quite normal.

After these preliminaries, most children are sufficiently interested to accept a hand-mirror in which to watch me work. There is every reason that the child, in accordance with the degree of intelligence he has attained, should be enlightened on the progress of the work so that he will acquire an active interest in it and learn to evaluate correctly good dental results.

I should like to add that the hand-mirror must be light in weight, and is best with a movable handle, so that children can manipulate it in dull moments.

With the mirror in his hand, the child feels a sense of relief, for he knows you are not going to do anything unusual, unexpected, or anything you do not want him to see, or you would not give him the mirror. I have found that children do not impede the work, as they soon tire of holding it and put it down; and should they hold it too close, the nurse gently guides it to a position where they can see without obstructing my view.

These methods which I now find so useful in my orthodontic practice, I have carried over from former days when I did general practice. Then, in order to excite their interest in a cavity, I would invite them to watch in the mirror for the astonishing things I would draw forth from the cavity with my excavator. With a little imagination, this can be made an interesting game.

A typical procedure is to exclaim with astonishment when beginning to excavate a cavity: ''Oh, there's a piece of banana down there, we must get that out!'' and ''What's down in that corner? That must be chocolate!'' and the nurse joins in the ruse, saying: ''Why, I really believe it is!''

It has been my experience that children will bear pain if they are prepared for it, that is, they must have the privilege of saying ''Ow!'' when they feel the drill, with the promise that the operator will stop at once. If this promise is kept, and the operator works from a less sensitive part back toward the painful one, he will find that they will bear more and more pain each time without any ill will. What children dislike most of all is unexpected pain and arbitrary treatment, and therefore a running commentary on the work in progress enlightens and pacifies them.

In the case of a very small child in pain, I would say, when putting in the cotton rolls: "Now we will put a little rolled-up blanket on this side of the poor sick tooth, then another on the other side. Now, some nice medicine that will make the sick tooth feel better right away. Now, we will take out all the bad part that makes the tooth feel so sick."

When the moment for the actual filling of the tooth arrives, children old enough to hold the mirror are usually sufficiently interested and friendly by this time to hold still and let you finish your work, but with smaller children it is often necessary to distract their attention from the discomfort of holding their mouths open so long by telling them a novel animal story.

The purpose here is to divert the child's mind to something pleasant and interesting. Children love animals, and I used to tell some such story as follows, intermittently, in the following manner.

While putting the cotton rolls into the mouth I began: "Once upon a time, there was a farmer in India, who had an elephant instead of a donkey to do his work. He also had a pet monkey.

"Now, the elephant and the monkey were friends." (Open your mouth a little wider and keep your tongue still, and I'll tell you some more.) "At the edge of the farm there was a wood with a tree full of nuts. The monkey used to go up the tree and eat the nuts. Now, in the wood there was a snake, and one day he saw the monkey go up the tree, and the snake said to himself, 'I'll wait here and get that monkey.'" (Do you know what happened next? Well, open a little wider and hold your tongue still, and I'll tell you.) "When the monkey came down and turned to run off to the house, he saw the snake with his mouth wide open, and he just stood still and screamed at the top of his voice." (Open your mouth a little wider and hold your tongue still, and I'll tell you what happened next.) "The elephant heard the monkey scream and knew he was in trouble. He hurried down to the wood, and when he saw what was happening, he crept up quietly behind the snake and put his big foot right down on him." (Open your mouth a little wider, and I will tell you what happened next.) "Then the monkey ran up the elephant's trunk, on to his head, his teeth chattering so that you could hear it all over the wood. Very soon the master arrived, and the monkey made one bound onto his shoulder and jabbered into his ear, trying to tell him all about it, but the master could not understand the monkey. Then the elephant lifted his foot, and the master saw the dead snake and understood all the little monkey had been trying to tell him." The story is drawn out in this manner until the work is finished.

You see the rôle we must play, and if I might be permitted to use an analogy, perhaps that of the actor would be the most accurate, for like the actor you must treat the child as an audience, and seek to convince him that you are the character you are attempting to portray, that is, that you are his friend; but a child's friend must be childlike, must look at things from a child's point of view. Therefore, like the actor who divides himself into two parts, one which he is portraying, while the other remains his conscious self, guiding and controlling his performance; so the dental surgeon must always be doing two things;

he is first and foremost the child's friend, but of course, at the same time he is the dental surgeon, quite unaffected and undistracted by what he is saying.

The actor's attributes are very necessary when dealing with the older, wilfully naughty child, the one who either refuses point-blank to get into the chair, or, once in the chair, makes rude remarks and embarrasses the mother. Here it is essential to appear entirely unmoved, and, completely ignoring the child's behavior, to carry on in your most soothing voice a conversation with the mother on some interesting aspect of eruption. Soon, feeling neglected, the child approaches, and I illustrate the point by showing the mother, with my finger, some tooth in the child's mouth, and the trick is done.

There is still another aspect of this problem; often not only is there the child's natural distrust of a stranger to be overcome, but in addition he is terrified and rendered hysterical by previous pain; therefore something more than mere friendliness is required. The child is in need of comfort and sympathy; confidence must be established in your ability to remove the pain. A kind voice, manner, and touch help greatly to create the atmosphere of relief and confidence which inevitably ensues once the patient believes that you can help him, but a genuine feeling of sympathy and desire to alleviate pain must be present, for this cannot be simulated.

Finally, we must realize that work with children is of importance to one in general practice, for it is by learning to deal skillfully with the more plastic material of the child that we acquire the technic which will inspire confidence in the adult, who owing to pain, previous or present, has been reduced to a mental condition often strikingly similar to that of a child, but whose intelligence is such that he understands from the air of confidence that we bring with us from our treatment of the child patient, that we can help him.

We see that far from being a mere technician, the dental surgeon has a difficult psychologic rôle to play.

DENTAL CEMENTS

WILLIAM A. GARRETT, D.D.S., ATLANTA, GA.

THERE is no material used by the dentist in his everyday practice which involves more applied chemistry than do dental cements. Therefore, the intelligent use of cements requires an appreciation of the chemical phenomena involved.

All dental cements are prepared by adding a basic powder to an acid liquid until a puttylike mass is produced. In a short time this mass hardens or sets, owing to the chemical reaction between the powder and the liquid. The majority of the cements on the market today employ phosphoric acid solutions as the liquid, and copper phosphates, zinc phosphates, oxyphosphates, and silicates for the powder. The character of the hardened cement depends fundamentally upon the powder, and the working qualities are influenced to a large extent by the liquid. The reactions between solids and liquids are known as heterogeneous reactions. These reactions have been investigated by the manufacturers, and an equation describing them has been deduced. This equation is the fundamental governing the manufacture and sale of dental cements. The scope of this paper, however, does not require the specific application of this equation in the production of cements.

THE DIFFERENT CEMENTS

Copper phosphates are seldom used, because of the color, unless the germicidal action of the copper is required.

Zinc phosphate cements, which are most commonly used, include those for attaching crowns, bridges, and inlays.

Silicate cements are used chiefly for fillings; although recently a silicate crown and bridge cement has appeared on the market, viz., kryptex.

CEMENT POWDERS

Commercial zinc oxide and concentrated phosphoric acid mixed together give an instant reaction; the mass sets rapidly with generation of considerable heat, and results in a porous, friable cement. The problem in developing a satisfactory cement is to retard this reaction sufficiently so that time is given for proper manipulation and to reduce the heat formation during the hardening process. To do this two things are necessary: first, vary the surface of the powder; second, vary the concentration of the phosphoric acid in the liquid.

Commercial zinc oxide is prepared in finely divided form, a very light and fluffy powder with very low density, which has to be increased by heat. The powder is fused; then the fused mass is crushed and ground; when this has been done, the density is greatly increased; and the activity when the powder is mixed with acid, that is the heat generation, is correspondingly reduced. Its fineness and consequently its reaction rate can thus be controlled. So much for powder.

CEMENT LIQUIDS

The activity of the liquid can be changed by varying the amount of free phosphoric acid in the solution or by partly neutralizing it. Both methods are employed. If a large amount of water is present in the liquid, an excessive amount of free water will remain after the cement is crystallized, which will weaken very materially the hardened mass. On the other hand, if the water is reduced to the proper amount by adding phosphoric acid, the acid will be too concentrated, and rapid setting with heat production will be the result. Therefore, partial neutralization is resorted to by the manufacturer; I mean by this that partial carrying out of the chemical reaction between the powder and the liquid is produced by the manufacturer before the cement is placed in the hands of the consumer. In other words, when the powder and liquid are turned over to the dentist, they represent an arrested chemical reaction, which the dentist proceeds to complete when he uses the cement. This is the reason why too much stress cannot be placed upon the proper mixing of this liquid and powder by the dentist in order to carry out the chemical reaction started by the manufacturer, and which is most necessary to produce the proper end-result. The manufacturer of integrity designs his cement to give certain desirable properties when it is handled in an average manner, under average conditions of temperature and humidity. The reaction rate, however, to a great extent is in the hands of the dentist. By adding the powder in large quantities and too rapidly, he exposes a large surface of powder to strong acid, resulting in very rapid setting. On the other hand by adding the powder slowly and in small portions, with spatulation between each addition, the liquid is progressively neutralized, thus producing a slow setting cement. So a thick mix contains more powder which exposes more surface to the liquid, and sets more rapidly than a thin mix.

It is very important to remember that the chemical reaction between the powder and the liquid, and the hardening of the cement are two distinct and separate though interdependent phenomena. The chemical reaction produces new compounds. These compounds first saturate the solution, then separate from it; therefore, hardening does not depend on the formation of these new compounds but on their deposition in a continuous phase. For instance, if the deposition of these new compounds is too much interfered with by excessive spatulation, the formation of a continuous solid mass is prevented, and a very weak and friable cement is the result. Fundamentally then, hardening begins when spatulation ceases, and the hardening rate depends on the reaction velocity from that time. So it is evident and true that the working of the cement depends on the mixing technic furnished by the manufacturer. Mixing has a most important effect on the durability because, as stated above, the hardening depends on the deposition of these new chemical compounds in a continuous mass which surrounds the particles of powder and binds them together. If mixing is continued too long, these new compounds will be deposited slowly, and before a resulted mass is formed, saliva may come in contact with the cement and destroy it.

Good results cannot be obtained unless the powder and liquid are mixed together to a uniform mass. If there is any unmixed powder, a chalky layer

exists which, at best, is mechanically weak, and, if it appears on the surface, is a weak point for the fluids of the mouth to attack the cement. On the other hand, if there is some unmixed liquid in the cement, this also forms a mechanical weakness if buried in the mass, and if near the surface it will be disclosed by the saliva.

The cement must be kept dry until it has set, or it will be destroyed by the saliva washing out the free liquid from around the crystals of powder and breaking up the continuity of the mass which will render it chalky and weak. It must be kept dry until enough interlacing crystals of zinc phosphate are formed to prevent the saliva from getting into the mass and the liquid from getting out.

Then the setting of the cement is dependent on the composition of the liquid. If this is changed, the setting velocity is changed. The bottle of liquid should never be left uncorked, exposing it to air, because the water will evaporate. The average liquid is nearly 50 per cent water. Of course the liquid is then no longer of the composition so carefully adjusted by the manufacturer to give certain predetermined results. The liquid should be carefully stored and kept tightly corked.

SILICATE CEMENTS

The silicate cements differ from the phosphates mostly in the composition of the powder, as the only practical difference in the liquid is the amount of H_2O.

The powders are acid-soluble glasses, which are made by melting silica alumina and fluxes together. The resulting glass is then crushed and ground to a fine powder. It is generally understood that silicate cements require more careful manipulation than zinc cements.

Successful manipulation of silicate cements depends fundamentally on mixing rapidly to the proper consistency because silicates set by the gelation of silicic acid. This occurs rapidly; therefore the liquid must be slow setting to give sufficient working time. Insertion of filling should be prompt, and it should be allowed to harden undisturbed because the silicic acid gel once broken does not form again; as in the case of zinc cements, and the continuity of the mass is permanently impaired. So it must not be worked after hardening begins. No time should be lost in insertion and applying strip. Strip should remain in place until considerable mechanical strength is developed; then there is no danger of rupture. The filling should be protected from moisture for at least twenty-four hours before polishing.

SIX SIMPLE RULES OF MANIPULATION OF SILICATES

1. Mix powder and liquid together rapidly. 2. Be sure of uniform consistency throughout the mix. 3. Insert promptly and with the least manipulation possible. 4. Keep absolutely dry. 5. Allow to harden undisturbed. 6. Cover with varnish and do not polish for twenty-four hours.

Most of the good and bad qualities of silicate cements are due to silicic acid. If water is withdrawn from the surface of the cements during setting, the acid is dehydrated and a chalky layer is formed. In this way the strength and translucency of the surface are seriously impaired; therefore, a cavity should never be drastically dehydrated before the filling is inserted, since the desiccated

dentin will withdraw liquid from the plastic silicate. It is also very necessary to prevent dehydration of the surface by evaporation during polishing and finishing the filling by the liberal use of cocoa butter. Silicate cements are rarely successful in the anterior teeth of mouth-breathers for this reason.

Translucency is a very valuable quality of silicates, but it is not fully developed immediately on mixing. Time is required for the reaction to be complete and for the mass to become uniform throughout, this takes about twenty-four hours. Translucency is mostly in the hands of the operator, and if it is to be obtained, two precautions are absolutely necessary. The smallest amount of colored material produces marked effect on the color of the cement. The darkest gray cement obtainable has only about one part of pigment to 5,000 parts of colorless base. So the smallest bit of dirt or dust worked into the cement will ruin the color. A fresh mix of cement is much whiter than the same shade will be after it has set for a few days. Therefore, often the filling which was a perfect shade when placed may be dark enough to become conspicuous after a few days. The dentist should always use the shade guide provided by the manufacturer and select a shade which will be apparently some lighter than the tooth to be filled when freshly inserted. A little practice will teach about how much lighter to make the fresh mix so that the finished filling will be the proper color.

Since the earliest use of dental silicates, irritation of the pulp has been considered dangerous. All silicate technics, therefore, contain steps to guard against the passage of the acid from the cement to the pulp. If the cavity extends into the dentin, a lining of varnish is recommended; but in deep cavities the operator should cover the floor of the cavity with zinc phosphate cement. The cavity should be sterilized with beechwood creosote, phenol or thymol; do not use alcohol nor chloroform. The presence of arsenic in the silicate, which has long been considered by the dental profession one of the greatest dangers to its use, is a remote possibility today. It can easily be detected, both in the raw materials and in the finished product. Another supposed cause of pulp irritation is the acidity of the cement, but it has been shown that copper cement is even more acid than silicate cement, yet copper cement is used in the deepest cavities without any apparent damage to the pulp, whereas if silicate is used in the same cavity the pulp is very likely to become involved. If copper cement, which is much more acid than silicate cements, does not produce irritation to the dental pulp, I am convinced that acidity is not the cause of irritation, but more likely, I should say, infection resulting from lack of proper sterilization is the cause. It is my belief that operators who practice proper sterilization can use silicate cements very satisfactorily. There may be one other cause of pulp irritation from silicates which should be mentioned. This occurs in a deep cavity which is filled to excess and the strip is drawn firmly down across it, forcing the cement into the tooth under pressure against the thin walls of overlying dentin. This pressure may cause a deflection of the dentin wall, resulting in pressure on the pulp, and subsequent irritation, trauma and death. This can be easily overcome by strengthening the floor of the cavity with zinc oxyphosphate cement lining.

SUMMARY

1. Know the properties of the materials you are using by careful study of the literature and instructions furnished by the manufacturers.

2. Careful cavity preparation.

3. Proper sterilization and lining of cavity where indicated.

4. Cleanliness of materials, slab, spatula, and instruments.

5. Use shade guide furnished by manufacturer for his materials.

6. Thorough mixing of powder and liquid to obtain uniform consistency of mass, but avoid overspatulation. Too many men try to place fillings after the mass has begun to harden.

7. Place the cement in the cavity with the least possible manipulation; force to place and do not disturb while setting.

8. Allow it to harden thoroughly before removing the strip. Personally, I keep an excess of the mix as my guide in removing the strip after it has hardened.

9. Keep absolutely free from saliva and moisture while setting.

10. Cover with cavity varnish furnished by the manufacturer for his material, and allow to remain for twenty-four hours before polishing. And while polishing filling, keep it well covered with cocoa butter.

CHILDREN'S DENTISTRY IN THE CURRICULUM OF THE DENTAL SCHOOL

JOHN C. BRAUER, D.D.S., LINCOLN, NEB.
Instructor in Operative Dentistry and Pedodontia, University of Nebraska

A RECENT survey shows that a majority of the dental colleges now have a course of instruction in children's dentistry. The extent to which instruction is given depends upon the experience and interest of the staff in this subject. Some schools have no definite pedodontic program because of the lack of finances, of financial return, or of interest.

The American Society for the Promotion of Dentistry for Children has a college committee which is making a survey of the needs in the course of instruction for children's dentistry. It is desired that there be a standardization in such instruction.

The following outline is not intended to represent standardized instruction in pedodontia, but merely to show the method employed and the contents of such a course at the University of Nebraska. There are, no doubt, many things that could be added or omitted from this outline, depending upon the experiences of the instructor.

I. History of Dentistry:
   - A. General dentistry—brief
   - B. Children's dentistry
     1. Literature
     2. Contributions

II. Embryology or Early Developmental Periods of Body, Face, and Teeth:
   - A. The development of the three body layers and derivatives
     1. Ectoderm
     2. Mesoderm
     3. Entoderm
   - B. The development of the face
   - C. The development of the teeth
     1. Structures developing from ectoderm, mesoderm, and entoderm
     2. Periods of calcification
        - a. Deciduous teeth
        - b. Permanent teeth
     3. Periods of decalcification
        - a. Deciduous teeth
        - b. Permanent teeth

III. The Eruption of Teeth:
   - A. Time
     1. Deciduous
     2. Permanent

B. Manner of eruption
   1. Physiologically
      a. Clinical and histologic picture
   2. Pathologically
      a. Etiology
      b. Treatment

C. Resorption
   1. Etiology
   2. Clinical and histologic picture

IV. Examination of Child Patient:
   A. First appointment
   B. Case history
   C. Oral cavity
      1. Gums and contingent tissues
      2. Cavities
         a. Depth
         b. Vital or nonvital involvements
      3. Past care of the mouth
         a. Fillings
         b. Extractions
   D. Age
   E. X-ray pictures

V. Types of Children:
   A. Normal
      1. Mental
      2. Physical
   B. Abnormal
      1. Mental
      2. Physical
   C. Timid
   D. Spoiled
   E. Defiant

VI. Management of Children:
   A. Appointments
   B. Analysis of the child
   C. Fundamentals in child psychology

VII. Filling Materials:
   A. Gold
   B. Amalgam
      1. Silver
      2. Copper
   C. Cements
   D. Other materials

VIII. Preparation of Cavities:
- A. Classification
- B. Procedures
- C. Variations

IX. Filling of Cavity:
- A. Instrumentation
- B. Cavity lining
- C. Silver nitrate
  1. Its uses

X. Prophylaxis:
- A. Instruments
- B. Time

XI. Root Canal Therapy:
- A. Indications for treatment
- B. Contraindications
- C. The vital tooth
  1. Treatment
  2. Appointments
  3. Variations
  4. Permanent anterior teeth
- D. The putrescent tooth
  1. Treatment
  2. Appointments
  3. Variations

XII. Space Retainers:
- A. Uses
- B. Construction

XIII. Business Fundamentals as Applied to Children's Dentistry:
- A. Routine
- B. Practice building
  1. Suggestions
- C. Records

XIV. Nutrition and Its Problems:
- A. The minerals
  1. Source
  2. Therapeutics
- B. The vitamins
  1. Source
  2. Therapeutics
- C. A balanced diet
  1. Source
  2. Prerequisites

XV. Diagnosis and Prognosis of Clinical Cases:

A. Case histories
B. Models
C. X-ray pictures
D. Hypothetical cases

The order of presenting the various phases of this subject may be arranged to accommodate the local environment.

The first three general sections of this outline, I, II, III, are given as a foundation for the rest of the course. Section II-C and III are especially important and should be stressed, since they entail the diagnosis and prognosis of many cases. The thoroughness and interest in Section IV will largely determine the success or failure of the operator. The Sections V to XIV are general considerations, any one of which is a prerequisite to successful practice.

Nutrition and its problems certainly have a place in the curriculum. Many problems in our children's practice deal especially with nutrition. It is only fair to the student that he be given at least a general knowledge of this subject.

Section XV can be made a most practical and timely subject. The student at this period in the course has an adequate background to discuss the diagnosis and prognosis of many cases.

Standardization of certain fundamental procedures in the instruction of pedodontia should be the object in schools of dentistry. Variations in the contents of the course and presentation will vary with the experiences of the staff. The question of adequate instruction is a problem to be solved not only by those interested in teaching but also by the profession in general and the laity.

LOW COST ALLOYS AND THEIR APPLICATION IN PRACTICE*

R. C. Willett, D.M.D., Peoria, Ill.

EXPERIMENTS in the processing of low cost alloys were first made to meet the demands of dentists employed by orphanages and public dental clinics where no funds were appropriated for the purchase of precious metal alloys commonly used in private practice.

As a result of those experiments and repeated tests in the mouth, two low cost alloys possessing desirable physical properties have been produced. These alloys are not recommended as substitutes for alloys of higher precious metal content in the general practice of dentistry. They are introduced solely to meet the need of cases demanding economic consideration where the present cost of high grade precious metal alloys becomes prohibitive. These alloys will be designated as Formula No. I and Formula No. II.

FORMULA NO. I

This is an alloy suitable for inlays and certain types of one-piece castings that do not require the physical properties that are necessary for spring clasps or thin cast base dentures. The metals combined to make this alloy are approximately as follows:

Silver	79.29 parts
Copper	19.29 "
Zinc	.71 "
Tin	.71 "
Total	100.00 "

As a convenience in procuring the metals and successfully processing the alloy in small quantities, without a segregation of the elements occurring, two alloys that contain the necessary metals are combined in the following proportions:

Sterling silver	12 dwt.
1 U.S. penny (new coinage)	2 "

The formula of sterling silver is:

Silver	92½%
Copper	7½%

The formula of the U. S. penny (new coinage) is:

Copper	90%
Zinc	5%
Tin	5%

The most satisfactory way to melt these alloys together is to use prest-o-lite or oxy-hydrogen gas with the proper type of torch for such a flame.

*Presented at the Thirteenth Annual Meeting of the Southern Society of Orthodontists, Hot Springs, Va., July 16-18, 1934.

The 12 dwt. of sterling silver are first melted down on a clean charcoal block and permitted to cool to a cherry red color. The penny is then placed on top of the hot sterling silver ingot and the torch flame pointed directly upon it. As the penny melts down, the sterling silver melts through it. When cooled, the ingot is turned over and melted down again. This process of melting the alloy is repeated. It is then in a suitable solution for use. During the process of melting and remelting the alloy, a reducing flux powder is used lightly to control the retention of copper.

This alloy responds to a limited degree to heat treatment much the same as precious metal alloys, but because of the tin and zinc it contains, the melting point is low. Because of this characteristic, it is not a satisfactory alloy to use in work that involves the soldering of attachments. It makes a beautiful inlay or overlay that does not tarnish in the mouth. Standard formula sterling silver should not cost more than 60 cents per ounce, and at that price Formula No. I can be processed for less than 65 cents per ounce.

FORMULA NO. II

Because of the many uses to which casting alloys can be put in this important work, it was necessary to produce one that possessed physical properties that compared favorably with high grade hard gold alloys.

Without entering into the details of the early failures and disappointments attending many experiments in the production of an alloy possessed of the widest range of desirable physical properties, the most satisfactory one to date will be given. The formula is a simple one and is given in the quantities by weight and in the order in which the metals are melted together:

Palladium	5 grains
Pure gold	10 "
Sterling silver	85 "
Total	100 "

The component parts of this higher fusing alloy will be described in the order of their greater quantities. Silver is the predominating element and is used because it reduces the cost of the alloy. The small percentage of copper is necessary as it confers two important physical properties: hardness and elasticity (Weinstein in Prothero's *Prosthetic Dentistry,* and other metallurgists). Copper enters this complex alloy through the sterling silver which is 7½ per cent copper, but in consideration of the addition of 15 parts of other metals to make the specified amount of alloy under discussion, its percentage is reduced to 6 per cent plus and the silver to 78 per cent plus.

The 10 parts of gold specified in this formula are used for two distinct purposes: first, to reduce the melting point when combined with 5 parts of palladium before the addition of the silver-copper alloy, and, second, to reduce the tendency of the alloy to tarnish.

The melting point of palladium is about 2845° F. It is used in this alloy because it is estimated to be 50 per cent stronger than gold. It raises the melt-

ing point in this combination of metals to between 1800° F. and 1900° F. and is possible of being melted down at that temperature with the usual gas and air torch.

Palladium is lighter in weight than gold, having a density about two-thirds that of gold. In its pure state, it does not tarnish and is said to resist the action of oral secretions.

Palladium has one characteristic that must be guarded against. It is soluble in nitric acid. Other acids than nitric should be used in pickling an alloy containing a quantity of palladium.

The cost of palladium varies greatly according to where it is purchased. Dealers in dental golds usually charge one-third more for it than precious metal refiners who sell principally to jewelry manufacturers. Unless the general market value has recently advanced, this metal should not cost more than $25 per ounce.

In making the high fusing alloy that I have suggested, using palladium 5 parts, gold 10 parts, and sterling silver 85 parts, the metals have been weighed out in those proportions to total 100 grains.

The metals do not segregate if the alloy is processed as described. The 5 grains of palladium are first melted down on a clean charcoal block with an oxygen flame in combination with city gas. The charcoal block is essential when making small quantities of this alloy. When in a fluid state, the 10 grains of pure gold are added, which forms a lower fusing alloy. The sterling silver is melted into the mass, using the same oxygen-gas flame, with caution against overheating, and, at the same time, sprinkling on a strong reducing flux. At no time should the molten mass of alloy become more than a boiling liquid under the flame, and it should never be permitted to sputter. This caution is given because the copper content in the sterling silver could be materially reduced by overheating.

If these directions are followed as given, I see no reason why any dentist who may choose to use such an alloy cannot make it in his own laboratory at an approximate cost of $6 per ounce; although this cost, of course, will depend upon the market fluctuations and the place where the ingredients are purchased.

The elements in this metal hold together very well and do not appear to segregate any more than casting gold alloys do when repeatedly used. In casting, this alloy appears to possess about the same physical properties as high grade gold alloys. Gold solder made for 22K gold plate can be readily used in soldering attachments to thin overlays cast in this alloy.

The objectionable feature to Formula No. II is that in most mouths it turns dark. Further experiments prove that by increasing the amount of gold and palladium and in just proportion reducing the amount of sterling silver alloy, there is less tendency to discoloration when used in the mouth.

With the increased percentage of palladium, the melting point of the alloy is materially raised, and to employ it as an alloy in casting it is necessary to use the oxygen-gas torch.

Based upon the latest market quotations (Sept. 11, 1934) the following tables show the cost per ounce to process the alloy with varying proportions of palladium, gold, and sterling silver:

10 grains palladium	$25.00 per oz.	$ .52
20 grains gold	35.00 per oz.	1.46
70 grains sterling silver	.60 per oz.	.09
100 grains		$2.07
1 ounce in same proportions as above		$9.92

12½ grains palladium	$25.00 per oz.	$ .65
25 grains gold	35.00 per oz.	1.82
62½ grains sterling silver	.60 per oz.	.08
100 grains		$2.55
1 ounce in same proportions as above		$12.25

15 grains palladium	$25.00 per oz.	$ .78
30 grains gold	35.00 per oz.	2.19
55 grains sterling silver	.60 per oz.	.07
100 grains		$3.04
1 ounce in same proportions as above		$14.58

THE NONVITAL DECIDUOUS TOOTH*

W. G. Stanton, D.D.S., Le Roy, N. Y.

THE problem of removal or retention of the putrescent deciduous molar has swung the pendulum of dental opinion from one extreme to another. Some operators are one hundred per cent in favor of extraction. Others will treat everything, good or bad. In the majority of cases, extraction is indicated. Regardless of the care we may exercise in periodic examination, there is presented in every practice the condition in which the operator feels he must save a nonvital or even a putrescent deciduous molar if possible. Most operators do not wish to undertake an extensive series of treatments, as frequently parents who permit their children to reach such a state do not wish to incur the expense incident to such a method that requires from five to seven appointments.

The method I am using cuts the number of appointments to three, and it is seldom necessary to use more. A radiograph will reveal the conditions, and the operator at a glance can decide whether extraction or retention is advisable in the cases he may be undecided about. If the root apices are closed with very little or no necrotic tissue, treatment is indicated. If no radiograph is taken, a fairly safe rule to follow is that if the fistulous opening is opposite the root end, treatment is usually successful. If the fistula is opposite the bifurcation or at the free margin of the gum, or if the floor of the pulp chamber is carious and perforated, extraction is indicated.

At the first appointment, gain access to the pulp chamber with a large rose bur and prepare the cavity thoroughly, removing all decay, for after the first treatment is sealed in, care must be taken not to reinfect or to let débris contaminate the pulp chamber and canals. Make the cavity large enough to accommodate a sufficient amount of medicine so that the treatment will be effective. I do not obtain good results using a broach in deciduous teeth. I have had grief almost every time I have used one, and I believe that the less instrumentation is done the better. The only exception to this is to establish drainage through the canal if pus is present. After the cavity is prepared and washed out with water, I insert cotton rolls and try to maintain a dry field for the next step. I dry the cavity with alcohol and warm air, and insert a pledget of formocresol and seal the preparation with gutta-percha. If pain is experienced, I remove the treatment and again wash out the cavity with alcohol and insert a pledget of carbolized resin. This usually obtunds any vital fibers, so that after it has been in for twenty-four hours, the formocresol can then be tolerated comfortably. The cavity preparation and inserting the first treatment should not take more than five minutes.

*Paper read before the Eighth District Dental Society of New York, Dec. 11, 1934.

The formocresol is a most efficient sterilizing agent. It has great penetrating power and does not coagulate. I believe the penetrating and then the hardening and preserving effect is particularly desirable, as it does not call for subsequent use of broaches with the danger of perforating root ends, or other overinstrumentation. The formocresol treatment should not be left in the tooth more than three days, and usually it has accomplished its purpose in twenty-four hours. If a fistula is present, it has usually disappeared after the first treatment. If the fistula is still draining, repeat the formocresol. If formocresol does not stop the flow of pus in two days, an x-ray picture usually shows that it was an error in judgment in trying to retain the tooth. Instruct the parent to bring the child in at once if tenderness develops. Remove formocresol, as overmedication with this drug is irritating. Treatment following the formocresol consists of thymol and chloral hydrate, equal parts in alcohol. Thymol is a general antiseptic and less toxic than phenol. Chloral hydrate with thymol acts as a sedative. After the formocresol treatment is removed, dry with alcohol and warm air, and insert a pledget of cotton with thymol and chloral hydrate solution. This should be sealed in for several days. Some operators use peroxide as a test following the formocresol, and if there is any effervescence, they place another treatment. If the cavity is large enough to permit enough formocresol to be inserted, I believe it unnecessary to use a check-up with peroxide. The second treatment should not take more than five minutes. The tooth then should be comfortable and able to stand mastication. Before removing the thymol and chloral hydrate treatment, mix a powder, consisting of fifteen parts zinc oxide with seven parts iodoform with one drop of phenol and one drop of glycerin. Mix to a thick, puttylike consistency. Then remove the thymol and chloralhydrate treatment and insert a generous amount of the paste to the floor of the pulp chamber. Then with a well-compressed pledget of cotton, larger than the cavity, press the paste well to place. Remove the cotton and excess paste. Then insert gutta-percha. Paste will ooze out around the edge. Remove this excess with a warm instrument, burnish again, and it will be found that close adaptation of gutta-percha to cavity walls can be accomplished. Remove excess gutta-percha, wash the cavity walls with alcohol, dry with warm air, and insert either cement or amalgam. Before I used this method, I was using different antiseptic pastes and cure-alls and came to much grief and loss of time. This is not an original technic. I picked it up at the 1932 A. D. A. meeting in Buffalo, from a practitioner from some western state. In my endeavor to avoid some of the pitfalls into which we all fall in caring for the putrescent deciduous tooth, I tried it out exactly as he prescribed. It has worked remarkably well for me. I feel confident that I have efficiently sterilized what might cause absorption of pus. By choosing only certain cases that I feel will respond favorably, the cases of failure are much less frequent than with a hit-or-miss technic, which I used prior to adopting this method.

The formocresol is Buckley's formula.*

*Made by Eli Lilly and Co.

The thymol and chloral hydrate solution can be made by the druggist. Both are very soluble in alcohol, and a saturated solution is the proper one.

The powder consisting of zinc oxide and iodoform, 15 parts zinc oxide to 7 parts iodoform can also be purchased already mixed from the druggist. It should be kept in a tightly stopped container. Phenol and glycerin complete the treatment.

GENERAL ANESTHESIA FOR CHILDREN

L. A. Gerlach, D.D.S., Milwaukee, Wis.

THE choice of an anesthetic for children, when an extraction service is to be performed, rests entirely with the operator. Some dentists prefer to administer only a local anesthetic; and when the occasion arises in which a general anesthetic is needed, they refer the patient to a specialist.

As we all know, in the last few years there has been a decided interest shown in children's dentistry; in fact, this interest has been so pronounced that it borders on enthusiasm. General practitioners have improved their office furnishings in such a manner as to encourage the influx of juvenile patients. With this improvement, they have availed themselves of opportunities and have taken special postgraduate courses in various phases of children's dentistry, preparing themselves to give a high type of service to children.

Extraction must be included in conducting a thorough practice for children. This service is very important not only from the health standpoint but also from the psychological aspect. It is generally agreed by pedodontists that if the child's first impression of a dental office and of the dentist in attendance is favorable, the progress of subsequent appointments will be greatly enhanced. Extraction service, either simple or multiple, is generally feared by both adult and child patients. The child's fear has been acquired from the parent. This is a result of the fact that adult patients are careless in discussing their extraction experiences, and naturally the children overhear the discussion and harbor dread of such a service. It is therefore imperative that the pedodontist make a favorable impression on the young patient at the initial visit, and then be prepared and equipped to administer an extraction service that will cause no pain nor allow any unfavorable impression to remain in the child's mind in regard to this phase of pedodontia.

The foregoing procedure cannot be carried out without the aid of general anesthetics. Although local anesthesia has its place in children's dentistry, the greater percentage of satisfactory extractions psychologically, economically, and efficiently, are accomplished with general anesthesia. Of the general anesthetics used in extraction service for children, two have perhaps become most prominent for use in the dental office, namely, ethyl chloride and nitrous oxide. Ether and etherized nitrous oxide have been and still are in general use, but in order to obtain satisfactory results it is necessary to hospitalize the patients. This, therefore, limits their use considerably, and they are not of especial interest to the average practitioner of children's dentistry.

It is necessary to discuss each of the two anesthetics individually, and then to summarize and compare the limitations, safety, and efficiency of each.

Nitrous oxide or laughing gas is an inhalation anesthetic and is administered by nose, mouth, or both. It is a gas (N_2O) with a slightly sweetish taste and

odor, and because of this fact is comparatively pleasant for patients to inhale. It was first prepared in 1772, and from that time until 1868 it was used periodically for short general anesthesia. It was not until 1868, however, that Dr. Andrews of Chicago combined it with oxygen to produce an even, practical anesthesia for a longer duration, allowing more freedom of time to the operator. This was an important step in the development of our present technics. Since the time nitrous oxide was first combined with oxygen, there has been a more general use of the anesthetic. Manufacturers have from time to time improvised and improved machines for its administration until at present a very efficient apparatus is on the market. It is very simple now for an anesthetist to administer nitrous oxide and oxygen to a patient and to control the depth and duration of the anesthetic with little danger involved for the patient.

Ethyl chloride is also an inhalation anesthetic. Unlike nitrous oxide it is a volatile liquid of aromatic odor and sweetish taste. When sprayed in quantities on gauze it frosts immediately, but will slowly volatilize and disappear. The drug was first discovered in the fifteenth century but was not used as an anesthetic until 1847. Following the discovery of its anesthetic properties it was used successfully as a general anesthetic for short operations. Perhaps its most general use was in England, but with mediocre results. The fatality rate was comparatively high, and for this reason it fell into disuse for almost half a century. It is only in the last twenty-five years that it has been revived. Somnoform, an anesthetic so popular for short operations a few years ago, contains 60 per cent ethyl chloride and 35 per cent methyl chloride. However, this formula is not constant, as some records show that some tubes of somnoform contain 83 per cent ethyl chloride. This anesthetic is still being administered by some practitioners, although its popularity has waned considerably in the last few years. From these figures it can readily be seen that the active constituent of somnoform is ethyl chloride. The increasing interest shown in ethyl chloride as a general anesthetic for short anesthesia in extraction work for children, has proved that it is practicable and can assume a definite place in the practice of pedodontia.

To classify each anesthetic as to when it is indicated is difficult, because all cases in which ethyl chloride could be used could be handled with nitrous oxide oxygen anesthesia; whereas all nitrous oxide cases could not be safely and efficiently handled with ethyl chloride. Therefore, the choice of anesthetics must depend entirely upon a study of the patients as they present themselves.

A very important point to be remembered about each anesthetic is its type. For instance, nitrous oxide oxygen anesthesia is induced with a specially built machine which can at any time force gases into the lungs. Therefore, when administering this anesthetic the anesthetist is able to prolong the anesthesia at a certain level by the control of the gases, thus allowing the operator ample time to complete extensive operations, such as multiple extractions. On the other hand, ethyl chloride as used for children's anesthesia is very simply induced without a machine. The anesthesia with this technic is very light,

being classed more as a deep analgesia. When the patient awakens, the operator must have completed his work in the short time allowed by the action of the anesthetic.

In summing up this information it would be logical to assume that ethyl chloride is applicable for those cases in which one or two deciduous teeth or one permanent tooth is to be extracted and little if any surgery is involved. Nitrous oxide should be used for longer anesthesia which is necessary when multiple extractions are indicated.

In choosing a general anesthetic the health and physical condition of the patient are paramount factors. Since both these anesthetics are of the inhalation type, the respiratory system plays an important part in their success or failure. Any chronic respiratory condition is definite countraindication to the use of these anesthetics. Often in children there is congestion in the lungs resulting from severe colds. In such cases it is necessary to postpone if possible the administration of the anesthetic until the condition has been relieved. Patients with lung infections, such as tuberculosis, are very poor risks for these anesthetics, and it is best for the patient and the operator to avoid using either ethyl chloride or nitrous oxide anesthesia. Cardiac lesions are always dangerous contraindications to the use of all general anesthetics. Although the percentage of children having heart disease is comparatively low, we do find children with well-defined heart lesions. Since every patient is in a mild state of excitement accompanied by a slight rise in blood pressure, there is always danger of shock. In cases of chronic cardiac disturbances a condition of shock is liable to prove fatal. When shock occurs, it is very difficult because of the heart condition to restore the patient to normal by artificial means. Kidney involvements also contraindicate the use of general anesthetics. Patients with acute or chronic nephritis in whom the function of the kidneys has been impaired are very poor risks. Before administration of a general anesthetic it is a good plan to obtain as complete a history of the patient as possible. With a complete history at hand, the dentist is able to determine the presence of a chronic ailment which might be a definite contraindication to general anesthesia. Wherever possible, especially in doubtful cases, it is good judgment to have the patient examined by a physician before an anesthetic is administered.

In all the cases of general anesthesia in which fatalities have occurred the mortality rate has been greatest in that class of patients pronounced physically fit for general anesthesia. Only one explanation is satisfactory in these instances. When a patient with a chronic ailment is refused a general anesthetic, of course there is no danger. However, when administration is necessary, the operator and the anesthetist are constantly on guard for symptoms of collapse. With this routine the anesthetist uses a minimum amount of anesthetic and very little danger is involved. In the perfectly normal patients the general procedure is employed, and when any irregularity occurs those in attendance are taken by surprise and consequently are not well prepared to administer artifical respiration. In this way valuable time is lost which may affect an instant routine in resuscitation.

The physiologic action of ethyl chloride is very much different from that of nitrous oxide. Nitrous oxide is known as an oxygen suffocation anesthetic. When administered, the nitrous oxide is inhaled and the order and degree of saturation take place in the following manner. When the administration is started, the inhaled air contains the most nitrous oxide. Because of the fact that all the inspired air does not gain access to the alveoli of the lungs, the expired air is next in the percentage of nitrous oxide contained. As the alveoli become charged with the anesthetic, they rank next in the amount of nitrous oxide contained, and lastly the blood contains the least. As the administration is continued, the blood absorbs the anesthetic and continues to do so until anesthesia is produced. When this stage is reached, the order of saturation is reversed, with the blood containing the most anesthetic and the inspired air the least. When the anesthetic is absorbed by the blood, the cells contain a much greater quantity than does the plasma. The nitrous oxide replaces the oxygen in the blood cells, hence the name "oxygen suffocation." Its action on the heart is little if any. The anesthetic action is produced on the central nervous system, the narcosis is caused by this action plus the lack of oxygen in the blood. Besides the great reduction of the oxygen content of the blood during nitrous oxide anesthesia there is a marked reduction in the carbon dioxide content. This being true, a combination of a small quantity of carbon dioxide (which is a respiratory stimulant) incorporated in the inspired anesthetic mixture will assist in maintaining even respiration and will result in a more satisfactory anesthesia with less danger to the patient.

Ethyl chloride as a general anesthetic has a very definite action on the circulatory system. There is usually a slight preliminary rise in blood pressure followed by a gradual lowering. This is easily explained since ethyl chloride has a definite stimulating effect on the vagus nerve and this effect is directly proportionate to the amount administered. The absorption of the anesthetic is rapid; in fact, the signs of anesthesia are difficult to recognize. As ethyl chloride is administered, the rate of respiration increases, although the breathing becomes more shallow. In cases of overdose, paralysis of the heart muscles is liable to occur, although it takes nineteen times as much ethyl chloride as chloroform to produce paralysis of the heart muscle.

The anesthetic action of ethyl chloride is produced by its effect on the central nervous system plus the fact that, because of its rapid absorption and effect on the circulatory system, a slight anemia of the brain is produced. However, in the technic of administration and in the use of ethyl chloride described in this paper the patient will rarely pass the stage of deep analgesia, which is the first stage of anesthesia. Under those conditions the danger of its use is reduced to a minimum because the moment light narcosis is reached operation is commenced and during this period air is being inhaled. When the operation has been completed, the child is recovering from the anesthetic. This procedure can be employed with this drug because of its rapid induction and elimination. It is exhaled and eliminated, as inhaled, through the lungs, and all traces of ethyl chloride disappear five or ten minutes after the operation.

As it has been said before, the only successful way to become an anesthetist is through actual experience. This, combined with a thorough knowledge of the physiological action of each anesthetic, will produce the desired result.

Before describing the technic and stages of anesthesia produced by both ethyl chloride and nitrous oxide, an important point must be stressed. Children are not physically and mentally matured and will react differently than adults to adult doses of any drug. In many instances only one-third or one-half the adult dose of a drug is required to obtain the desired action in the child. This is also true of anesthetics. The scope or range of anesthesia for children is considerably shorter than that for adults. When administering to children one must bear in mind the fact that they require a great deal less of the anesthetic to produce narcosis. One must also remember that they will pass from one stage of anesthesia to the next more rapidly than adults. This being true, it is essential that the anesthetist have full control of the administration and keep a sharp watch on the child at all times.

In describing the technic of administration of nitrous oxide it is well to remember that there are two different methods of administration. The selection of a method is entirely up to the anesthetist, governed, of course, by any idiosyncrasies of the patient, which will be determined by the case history.

The gas machines on the market today have been perfected to such a degree that the manipulation of them is simple. Any person by thoroughly examining and studying any of the standard machines can understand their operation in a short time.

It is best to have the patient refrain from eating or drinking for at least four hours before a general anesthetic is administered. If this rule is not followed, the patient is liable to become nauseated during the anesthetic or immediately following it, causing a great deal of discomfort to the patient, nurse, and operator. Before the patient enters the operating room he should be requested to step to the lavatory for as complete an evacuation as possible. Often during anesthesia slight relaxation of the sphincter muscles occurs; and if the bladder is distended, pressure from within, plus some relaxation of the sphincter, is liable to result in an involuntary accident.

Preparatory caution includes the proper placing of the patient in the chair, adjustment of the head, placing of prop and pack, and in fact everything leading up to the actual administration of the anesthetic.

After the patient is seated in the chair in the operating room, the operator must be sure that the patient's back is straight. This is accomplished by having the back of the chair as vertical as possible for comfort. The small of the back should be firm against the back of the chair. The head should rest comfortably against the headrest and be in a vertical line with the body. After the proper chair position has been attained, the entire chair may be tilted backward if the operator so desires. One can easily visualize or note from actual observation that with this position the patient is not able to slide down in the chair. The sliding forward of a patient makes it not only uncomfortable and awkward for the operator but also dangerous for the patient.

A person seated in a dental chair has a natural tendency to slide down. This is due perhaps to the dread of the operation combined with a slouched position in the chair with the back rounded. Should this position be assumed before the administration of nitrous oxide and should the patient slide lower in the chair, the head will be thrown forward and the chin rest on the chest. When this occurs, there is danger of mechanical blocking of the air passages, with probably serious results.

A junior chair for extraction under general anesthesia is indicated wherever possible. This does not mean than an adult chair cannot be used, but when this is necessary, a definite technic must be employed. When placing a child in an adult chair, one must bear in mind that the chair is too large. After the child has been seated properly, squirming, sliding, or leg movements tend to take the patient out of position. This being true, it is necessary to watch the child carefully, and should the position be involuntarily changed by the child during the anesthetic, it must be corrected at once.

With the patient placed in the chair correctly, the garments around the waist and neck are loosened so as not to cause pressure, and a mouth prop is inserted. Care in choosing the prop is necessary. A prop too large for the child will force his mouth open too far and may cause him to complain. It also will have a tendency to hinder normal breathing, since the abnormal forcing open of the jaws causes pressure on the throat from muscle activity.

Packing the throat is an important step in obtaining uniformly satisfactory results with nitrous oxide oxygen anesthesia. It is necessary when operating to have the flow of air through the mouth shut off. Before the operation is begun either the mouth is covered with a towel or with the mouth piece from the machine, depending on what method is used. However, when anesthesia has been produced, the covering over the mouth is removed to allow the operator access, and the throat must be packed to maintain the anesthesia. If the nitrous oxide is given by nose only, the throat can be packed before the administration starts or when anesthesia is complete. In treating children the placing of the pack before anesthesia may result in a protest. It is, therefore, practicable to pack the throat when narcosis is reached.

In packing the throat the tongue should be brought forward and the pack rolled back on the tongue until the throat is reached. The ends of the pack should then be gently forced back of the last molar teeth to prevent leakage or seepage from the buccal sides. At no time should the pack be forced against the throat, because if this occurs, it is liable to interfere with normal nasal breathing. The pack serves a double purpose. It prevents air from entering by mouth and removes the possibility of any blood clots, teeth, or débris from extracted teeth entering the throat. A condition of paralysis of the throat muscles may occur during anesthesia. Should the throat be left open under this condition, the blood and fragments of teeth will enter the throat and remain there, with a chance of their entering the trachea.

Strapping of children under twelve years of age for nitrous oxide oxygen anesthesia is not necessary. When husky youngsters from fourteen to sixteen

years of age are subjected to this anesthetic, a strap will prove practical. In strapping these children it is well to wait until anesthesia has been produced. This will help to avoid the stimulation of any fear they might have of the operation. Avoid placing the strap tightly around the waist or chest, as it might interfere with normal function or tend to slide up around the neck when the patient moves involuntarily. Confine the strapping to the arms and legs, and the results will be satisfactory.

Perhaps the commonest method in use is to administer nitrous oxide oxygen by both nose and mouth. By forcing the gases in this manner, anesthesia is produced more rapidly. A point very much in favor of this method is the possibility of obstructions being present in the nose. Large adenoids, catarrhal conditions, asthma, and deflected septums impair normal nasal breathing; and if in cases of this type the dual method of administration is not employed, it is difficult to produce and maintain proper anesthesia.

The second method though very practicable is not generally used. In this procedure the gas is given with the nasal inhaler only. It is necessary to pack the throat or hold the mouth shut during the period of induction to prevent the patient's breathing through the mouth. Anesthesia will be produced as in the first method, but more time will be consumed before the operative stage is reached. The only disadvantage in this method is the possibility of the patient's being a mouth-breather because of a nasal obstruction or a childhood habit. Combined with the methods outlined in the preceding paragraphs, there are two technics for giving the gas which are applicable in either method. One technic calls for the administration of straight nitrous oxide until anesthesia is reached and then gradually adding and increasing the oxygen as the operation proceeds. The other technic calls for the administration of a mixture of nitrous oxide and oxygen for the first breaths and then straight nitrous oxide until anesthesia is reached. The oxygen is again added to the nitrous oxide after anesthesia is reached and is increased as necessary. The one and only disadvantage of the first technic over the second is that if straight nitrous oxide is given to the patient at the outset, nausea is likely to be produced.

During the course of administration of nitrous oxide there are three distinct stages through which the patient passes.

First stage: The induction stage. If straight nitrous oxide is administered, it requires only six to ten breaths before a child has passed through this stage. Where a mixture of 93 per cent nitrous oxide and 7 per cent oxygen is given, the child passes through this stage in about 45 seconds. During this stage the patient inhales the gas readily, and there is a feeling of warmth to the lips, and the patient experiences an indescribable though pleasant numbness and thrill. This may also be called the analgesic stage. The respiration and pulse are usually quiet and normal, although the respiration may become deeper and accelerate slightly. The eye and pupil remain normal, as does the patient's color.

Second stage: This may also be termed the excitement stage. The word "excitement" is used perhaps somewhat ambiguously here. Very rarely does

excitement occur during this stage. It is necessary when approaching children to assume a friendly attitude. If the child has been properly handled preoperatively and is in a receptive mood, little difficulty is encountered. However, if the child fights during the induction period, the anesthetic must be forced; and when the second stage is reached, this excitement will increase until narcosis is reached. In adult administration straight nitrous oxide is administered during this stage. In children it is optional with the anesthetist as to whether straight nitrous oxide be given or whether the original mixture of 93 per cent nitrous oxide and 7 per cent oxygen be adhered to. In cases in which the child fights the anesthetic, it is perhaps better to give straight nitrous oxide and to obtain narcosis as soon as possible. When the child is in a receptive mood, it need not be given. Here again we must remember that the range of anesthesia in children is much smaller than that in adults. In older children straight nitrous oxide can be given readily. However, when given to children under ten years of age, a sharp vigil must be kept by the anesthetist because the child is liable to drop to the dangerous stage very rapidly. During the second stage the following symptoms are evident: the pulse remains normal and full, with the respiration normal although somewhat stimulated and accelerated. A slight duskiness may appear at this stage, although the color depends on the amount of oxygen administered with the nitrous oxide. The eye remains almost normal. The conjunctiva is sensitive to touch and the pupil may be slightly dilated. If any vomiting occurs during anesthesia, it will occur during this stage. However, children should always be prepared before the anesthetic to remove any possibility of this occurring. It is interesting to note that hearing may persist during the first and second stages; therefore, it is necessary to have the operating room as quiet as possible, especially for children.

Third stage: When the patient has reached this stage, the state of complete narcosis has been attained. The lid reflex has been abolished, the eyeball oscillates and gradually remains fixed and off center. The conjunctiva has lost its sensitiveness. The respiration may be a little rapid but remains regular and normal. The pulse may increase slightly but remains rhythmical. In some instances the pulse may be rapid before administration because of nervousness. However, as the induction advances, the pulse usually becomes slower, returning to normal under the anesthetic.

This is the proper stage of anesthesia for operative procedure. If straight nitrous oxide has been administered during the second stage, the anesthetist will gradually add oxygen to the nitrous oxide. This is necessary because the blood cells have become saturated with the nitrous oxide, and not so much nitrous oxide is needed to keep the patient in a safe uniform state of narcosis required for operative procedure. In lengthy operations it may be necessary to increase the oxygen in the mixture to 15 or 20 per cent before the operation is completed. Should the patient pass into a state of overdose, the symptoms are very marked. The respiration will become shallow and very irregular, and the patient's color will be blue. This blueness combined with perspiration will be very perceptible. Muscle spasm with jactitation will accompany this

and is a positive sign of oxygen lack. The eyeball will be fixed at the center with the pupil dilated. A quick remedy is to switch immediately to straight oxygen until the patient's color, respiration, and muscle actions are normal, and then proceed with more nitrous oxide. If the patient is not watched carefully and passes deeper into this state of overdose, the breathing may become very shallow and may stop completely. Therefore, it is important to recognize the stages of nitrous oxide and act accordingly. During the course of administration the patient's breathing is likely to become somewhat shallow. This makes it difficult to control the stages and to produce the proper condition of anesthesia conducive to operative procedure. As the percentage of carbon dioxide in the system is reduced during nitrous oxide anesthesia, there is no respiratory stimulant present. This is one of the reasons why the breathing may become shallow. It is, therefore, practical to add a small amount of carbon dioxide to the mixture to aid respiration and stabilize the anesthesia. Some operators prefer administering the carbon dioxide from the very start so as to eliminate the possibility of any irregularities occurring. It is optional whether the anesthetist prefers using the carbon dioxide when commencing the administration or whether it is added as the anesthesia progresses.

Ethyl chloride can be employed as a general anesthetic for prolonged anesthesia if desired. However, because the rapidity of its action makes the control very difficult, its continual use for long anesthesia involves a certain amount of danger. It seems foolish to endeavor to supplant nitrous oxide oxygen anesthesia for long operations with an anesthesia that is far inferior in action and which subjects the patient to more danger.

Ethyl chloride has a definite place in pedodontia as a general anesthetic for short operations, but is very limited in use. The technic that will be described here is so safe, simple, and economical that its use cannot be dispensed with. The aim is not to produce prolonged anesthesia as with nitrous oxide, but to produce a deep analgesia or light anesthesia for extracting one or two deciduous teeth. In order to use it successfully, one must understand its limitations and choose the cases suited for its administration. This method is applicable to children, and the dose to produce deep analgesia is surprisingly small. The same precautions as to approach of the child, position in the chair, and choice of mouth prop are observed before the administration of ethyl chloride as those described for nitrous oxide. The throat pack, so important in the success of nitrous oxide, is dispensed with entirely in ethyl chloride.

In administering ethyl chloride a piece of gauze, medium mesh double thickness, about four inches square, is placed over the mouth, and the anesthetist places his left arm around the child's head. The gauze is so placed that the top border covers the lower half of the nose. With the left arm around the head, the thumb and first finger of the left hand hold the nose shut, with the third and little fingers under the chin to hold the lower jaw steady so the prop remains firm. The second finger is allowed to rest on the lower lip. The child is then instructed to breathe through the mouth, and after the

first few breaths of air the ethyl chloride is sprayed on the gauze at the opening over the mouth. The tube is held in the right hand off to that side, the spray coming from an angle. In this procedure the child is not likely to become frightened, as nothing is held directly in front of his face. The ethyl chloride is sprayed intermittently on the gauze at the point over the mouth. Care must be exercised so as not to hit the lips because ethyl chloride is irritating and may alarm and frighten the child. If the child is receptive, he will close his eyes if requested and will breathe normally. The spray must be intermittent because of the frosting on the gauze. If the ethyl chloride frosts heavily on the gauze, the air is shut off and difficulty in breathing is encountered. A slight frosting is permissible, and as the child breathes the frost will disappear. The desired stage of anesthesia is produced in 45 to 120 seconds. The respiration remains normal throughout the induction and anesthetic states. A slight stertor is one of the signs of anesthesia and in some instances becomes quite pronounced. The lid reflex is lost, and the eyeball oscillates and may become fixed off center. In cases in which only one deciduous tooth is to be extracted, it is not necessary to administer a large dose, and in these cases the lid reflex becomes sluggish and the eyeball oscillates but slightly. Some anesthetists prefer having the child raise the left arm and hold it there. When anesthesia is produced, the patient relaxes and the arm drops. This, of course, is a definite sign of anesthesia. When this stage is reached, the gauze is lifted from the mouth and held under the nose until the operation is completed. In this manner the child receives a few more breaths of the anesthetic through the nose. The anesthesia will deepen slightly after administration is stopped because of the ethyl chloride in the lungs. As ethyl chloride is eliminated very rapidly, the duration of the anesthetic is very short, from two to five minutes, depending upon the dosage. The patient will invariably wake up with a startled look on his face and will either smile or cry depending upon what dream he has had. When children fight the anesthetic, it is necessary to speed up the induction and, because of the gasps from their crying, the ethyl chloride will be gulped in very rapidly and analgesia will be produced in a very short time. In these instances care must be exercised not to administer too much. There are four stages in ethyl chloride anesthesia before profound narcosis is reached. With this technic the first or induction stage, during which deep analgesia is produced, is the desired stage. This allows ample time for the short operation, involves no danger, and recuperation is almost instant. If the child advances to the excitement stage of anesthesia and fights and squirms a great deal, this action interferes with the operator and proves very unsatisfactory. Using this technic the dentist can administer the anesthetic and extract the tooth without the services of an anesthetist. However, the anesthetist can administer and, when narcosis is reached, raise the gauze, step back, and allow the operator to step in. Both methods are satisfactory.

A very interesting point about this technic is that since the patient is not carried to the stage of deep narcosis, and since air is administered with the ethyl chloride, there is no danger of overdose. This, therefore, makes it a

satisfactory and dependable agent in the hands of one who understands and recognizes the signs of anesthesia.

A word about resuscitation methods is appropriate here. If total collapse should occur during the administration of either ethyl chloride or nitrous oxide, it may be necessary to resort to artificial respiration. Under such conditions straight oxygen should be forced to the patient. In nitrous oxide cases this is very easily done since the oxygen is available, and in some instances artificial respiration should accompany it. This can be performed in the following manner:

With the patient sitting in the chair, the operator should clear the throat of mucus and be sure the tongue is forward; and if it does not remain forward, a tongue forceps must be used. In cases of total collapse the tongue drops back in the throat, and it is important to correct this immediately. The dentist then employs one of two methods: By placing the hand on the patient's chest immediately below the sternum and exerting pressure backward and upward, the gas in the lungs will be forced out. The pressure should be released sharply, and then the movement should be repeated in as rhythmical a fashion as possible to conform to breathing. By sharp releases the air or oxygen, as the case may be, will rush into the lungs and tend to revive the patient more quickly. Another method is to stand in front of the patient and place the hands on each side of the lower chest over the floating ribs with the thumbs forward under the costal arch. Pressure is exerted by the thumbs simultaneously and is released as explained above. In conjunction with this treatment and to facilitate revival, injecto-tubes can be used. Injecto-tubes of this type are ready for instant use. A needle is attached to the mouth of the tube with a screw cap hermetically sealing the tube and keeping the solution and needle sterile. When this is needed, all the operator has to do is remove the cap, puncture the patient's skin, and slowly compress the tube, and inject the solution subcutaneously. One tube contains a 2 grain solution of camphor in oil and the other tube a $\frac{1}{30}$ grain solution of strychnine sulphate. A dose of each of these can be injected simultaneously, and this dose plus the artificial respiration will aid materially in reviving the patient.

Although collapse following ethyl chloride as described in this paper is very rare, one should always be prepared to cope with the situation should it occur. Clear the patient's throat and bring the tongue forward, then invert the patient. It is simple to grasp a child by the legs and hold him upside down. Have the assistant begin artificial respiration and give the injections if necessary. If oxygen is available, a few deep breaths will aid considerably in speeding up recovery.

The economic aspect of any phase of dentistry must always be considered, especially under present conditions with the curtailed income and loss of savings which have affected so many people. In the use of ethyl chloride because of the low cost of the anesthetic, plus the simplicity of a technic which does not require an anesthetist, the cost to the dentist is very low. It is simple for the practicing dentist with the help of his assistant to administer the anesthetic and extract the deciduous tooth or teeth in a short time. With this

efficiency and the low cost of the ethyl chloride, the practitioner can render the highest type of service reasonably and still receive a fee commensurate to the patient and himself.

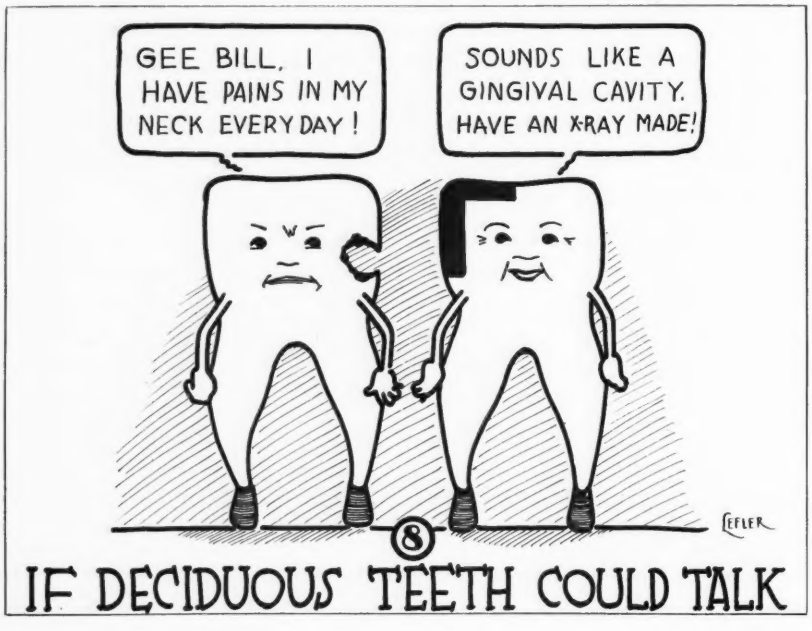
Nitrous oxide oxygen anesthesia with its specialized equipment and cost of gas, plus the services of a trained anesthetist and the time consumed in administration and recuperation, demands a higher fee. However, nitrous oxide has a definite place as a general anesthetic for both children and adults, and because of its safety and efficiency will never be supplanted. After all, the primary aim of the practitioner is to render the highest type of service to the public, and in so doing nitrous oxide oxygen anesthesia must be employed.

In conclusion it must be remembered that in pedodontia it is necessary to consider the physical and mental make-up of the young patient. Pain is one of the most important issues in the modus operandi when treating children. From thoughtless parents or playmates, children usually associate extractions with pain. Therefore, if by building up confidence of a child through successive appointments for operative work the dentist is able to advise the child of a painless extraction with a general anesthetic, the reaction will be favorable. When this stage is reached and the choice of either nitrous oxide or ethyl chloride is made, the operation will be a success, and the child not only will be satisfied but will remain a friend and an enthusiastic patient for life.

IF DECIDUOUS TEETH COULD TALK

HARRY B. SHAFER, D.D.S., ANNA, ILL.

THE deciduous teeth might be justified in protesting against what seems to be a reluctant attitude among dentists toward having x-ray examinations made to find interproximal cavities. In many offices, however, it is routine practice to



have x-ray examinations made of the permanent teeth at regular intervals; and when perplexing situations arise, these x-ray pictures are a most important diagnostic aid.

In the near future children's dentists undoubtedly will demand at least two thorough x-ray examinations of the interproximal surfaces of the deciduous molars, when children are four and seven years old.

Department of Orthodontic Abstracts and Reviews

Edited by

DR. EGON NEUSTADT AND DR. JOSEPH D. EBY, NEW YORK CITY

All communications concerning further information about abstracted material and the acceptance of articles or books for consideration in this department should be addressed to Dr. Egon Neustadt, 133 East Fifty-Eighth Street, New York City.

A New Book by Dr. Simon. Review of "System Einer Biologisch-Mechanischen Therapie der Gebissanomalien" by Dr. Paul W. Simon, 1933, Berlin, Hermann Meusser.

This book is to fulfill Dr. Simon's promise made by him ten years ago in his first work on gnathostatic diagnosis, that he would supplement his diagnostic treatise by a publication dealing with orthodontic treatment.

GENERAL ORTHODONTIC TECHNIC

The first part of the book deals with general orthodontic technic: the making of bands and the construction of labial, high labial, and lingual appliances.

Fig. 1.

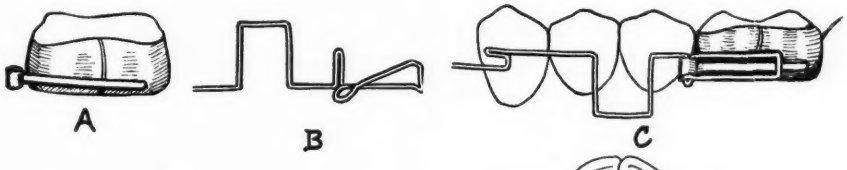
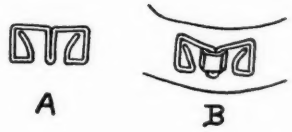


Fig. 2.



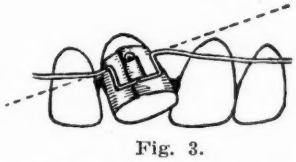


Fig. 3.

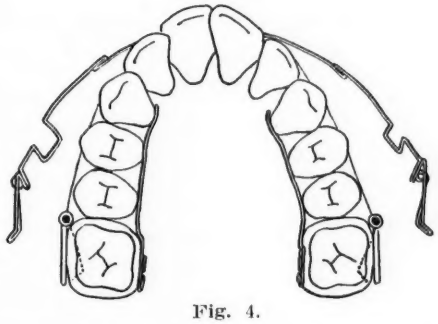


Fig. 4.

Fig. 1.—Labial molar attachment: *A*, female part; *B*, male part; *C*, assemblage.
Fig. 2.—Lingual molar attachment: *A*, male part; *B*, assemblage.
Fig. 3.—Attachment to incisor tooth.
Fig. 4.—Labial expansion arch with lingual extension constructed by the wire-bending method.

Stainless steel material is being used throughout, which fact necessitates certain changes from the commonly accepted appliance designs. Soldered attachments are restricted as much as possible and replaced by attachments obtained through wire bending. This method is carried out for labial molar attachments (Fig. 1) as well as for lingual molar attachments (Fig. 2) and for attachments to individual teeth (Fig. 3). Various forms of auxiliary springs are described and also the methods which are used to join them to the main wires, among them the spot welding process. (Fig. 4.)

GNATHOSTATIC DIAGNOSIS

The second part deals with the treatment of the different types of malocclusions. In an introductory manner, the principles of gnathostatics are taken up, and some improvements in the technic are demonstrated. The base of the gnathostatic model, for instance, is now made automatically (very much in the manner of the Porter Model Former); symmetrograph and diameter are supplanted by the new gnathograph.*

The orthodontic diagnosis which takes only occlusal landmarks in consideration is called "diagnosis incompleta" and is differentiated from the "diagnosis completa" which recognizes not only occlusal relationships, but also the relation of the dentition to face and head. New norms for the sagittal, the transverse, and the occlusal curves are laid down. It is stressed that all measurements undertaken to check the value of the orbital canine law must be conducted biometrically (on the living person) and not craniometrically (on the skull), and should comprise people of the same race, sex, and age. Despite this demand, however, Dr. Simon expresses disbelief in the findings of other authors that the relationship of the orbital plane changes with varying age. On the basis of Linder's examination records Dr. Korkhans has expressed the opinion that, with advancing years, the orbital plane lies farther and farther distal as related to the dentition. This is due to the fact that the lower part of the face grows forward more rapidly than the upper part, leaving the orbital plane behind (a condition to which also Dr. Ralph Waldron recently called attention). To disprove this theory, Dr. Simon reproduces photographs of two skulls, which show no change in the relationship of the orbital line though one represents the age of five years, and the other the age of eighteen years.

TREATMENT OF MALOCCLUSIONS

After a brief discussion of biomechanics, the treatment of different types of malocclusions by means of stainless steel appliances is described. First, the malpositions of individual teeth are taken up, then malocclusions of groups of teeth. The malocclusions are divided into deviations from the (1) raphe-median plane (contraction-distraction); (2) orbital plane (protraction-retraction); (3) ear-eye plane (attraction-abstraction).

These groups are further classified into three subdivisions. A contraction, for instance, may be dental (inclination of only the tooth crown lingually), alveolar (constriction of the alveolar process), or maxillary (constriction of the body of the maxilla). The alveolar protraction may be treated either orthodontically or surgico-orthodontically, with the extraction of the first premolars on one or on both sides.

Those readers who expected to find an amplification of Simon's diagnostic system in this book will be disappointed, for it is mainly technical in its character. However, the book itself should not be blamed for this disappointment. According to its title, it is to deal with the biologic-mechanical treatment of

*The improved apparatus is manufactured by W. Neuman, Schoenhauser Allee 82, Berlin.

malocclusions, and this it does, placing special emphasis on the use of stainless steel material. The author's ingenuity, well known from past instances, can again be discerned in the creation of appliance designs adapted to the new material.

Stainless steel is putting forth a strong demand for a place in our orthodontic laboratories. Even in the time since the book appeared, some important improvements have been perfected in its use. However, there is still a great handicap attached to it, namely the lack of easy soldering manipulations. Ingenious as Dr. Simon's new designs may be, the construction of appliances by the bending technic rather than the soldering technic, is more time consuming. The saving in expense of the material is outweighed by the loss of valuable time. It must also be remembered that gold platinum material can be returned for credit after being used. Steel has yet a great disadvantage to be overcome, and as long as it cannot be soldered with the same ease as gold, it will have to be satisfied with keeping second place.

The volume contains 287 pages with 401 illustrations. The diagrams for the appliance designs are clearly drawn and well reproduced. Binding, paper, print, and set-up are very attractive. A comprehensive table of contents reveals the thoroughly logical arrangement of the text.

E. N.

Dental Pharmacology and Therapeutics. By Dr. J. R. Blayney, 1934, St. Louis, The C. V. Mosby Company.

The author presents in this volume the principles of pharmacology and the essential facts about drugs. In a concise manner the composition of the drugs is taken up, their local and remote action, and their method of administration. Prescription writing is also discussed.

In order to facilitate the gathering of information, the drugs are conveniently arranged into groups according to their chief dental use. Among these groups we find the following main topics to which separate chapters are devoted:

Antiseptics, Germicides, and Disinfectants
Astringents
Escharotics or Caustics
Hemostatics
Anesthetics
Anodynes—Analgesics
Catharties
Antipyretics

Within each one of these chapters, the different remedies belonging there are listed, and discussed separately. First their source and their chemical characteristics are described, and their incompatibility with other drugs is noted. Then their pharmacologic action is discussed, and the individual difference of each drug is pointed out as related to the general pharmacologic action of its

group. Their therapeutic value is explained with special reference to their use in dentistry. Finally, their toxicology is given, and the proper antidotes are suggested.

The orthodontist and the general practitioner will find this volume a valuable reference book on account of its compactness. It will place them in a position to answer questions which patients ask from time to time relating to mouth antiseptics, to laxatives, or to anesthetics. It will also make them independent of the expensive and sometimes little reliable patent medicines.

E. N.

The Forum

Articles for this department should be sent to Dr. Albert H. Ketcham and Dr. William R. Humphrey, 1232 Republic Bldg., Denver, Colo.

A New Labial Section for the Hawley Retainer

Many variations of the Hawley retainer are in constant use, and it is merely the combination of several desirable features that gives us the retainer shown in Fig. 1, a type preferable in many instances to the more conventional styles in common use. It is particularly adapted, first, for use in instances where the bite plane is inserted for the purpose of opening the bite. There the aim is to allow the premolars to drop down into occlusion, increasing the curve of Spee. Second, it is indicated where the bite does not need to be opened, but where the mandibular first premolar occludes so tightly into its opposing embrasure that there is no room for the wire to pass through from lingual to labial at the usual place, a condition very commonly encountered.

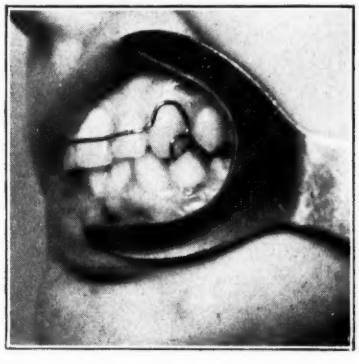


Fig. 1.

Retainers have been in use for some time with the labial section end passing over the canine cusp rather than distal to it; that is, in the embrasure between the canine and premolar. Generally there is sufficient room to pass the wire either over the point of the cusp or across the mesial or distal incisal edges without interfering with the bite. At the same time the premolars are entirely free to elongate, since there is no wire in contact with them at any point. We have found, however, that if after passing the wire through at one of these places the labial section is completed with the usual adjustable loops, there is loss of retention because no use is made of the bulging distal contour of the canine.

Fig. 1 shows how one may retain the advantages of having the wire pass over the canine and still utilize the convenient contour of that tooth to the full extent. The wire is given a right angle bend shortly after it reaches the

labial surface of the canine and is brought over to the distal incisal angle. Then it is carefully adapted to the cervical margin and at the mesial margin, just above the incisal angle, is again bent very sharply and brought across the incisors. Unless the canine is very short or of unfavorable shape there is no necessity for any clasp on the premolar.

If the labial section is to be removable after the fashion of Dr. A. F. Jackson of Philadelphia, which is by far preferable, there is another point in retention which is very important, and that is the close adaptation of the wire to the lingual of the canine. To secure this the section of wire from the anterior tube on the lingual surface of the vulcanite to the lingual surface of the canine must be imbedded in a groove made in the inclined plane, the depth of the groove depending on the height of the inclined plane. This groove can be cut with a small fissure bur of such size that the 0.030 in. wire can just be forced into it. The bottom of the groove should then be enlarged by boring through from one end; thus when the wire is once seated in the groove, it is not easily dislodged through the narrower neck. The labial section is made in two halves which are soldered in the median line. Stainless steel wire of 0.030 in. diameter works rather well because it is so resistant to bending.

The appliance is shown in a patient's mouth in which the bite is being opened to give a freer excursion to the mandible. The complete freedom given the first premolar to elongate is clearly visible; and while in this particular instance the wire happens to cross directly over a rather flattened cusp, the efficiency and stability of the plate are equally satisfactory in cases where the wire must pass directly over a sharp cusp, or at points mesial or distal to it. The retention feature lies in the section of the wire which follows the gingival outline of the tooth.

Paul V. Reid

The Undergraduate Orthodontic Curriculum

Every phase of dental teaching will eventually benefit from recent recommendations of the Curriculum Survey Committee of the American Association of Dental Schools. Orthodontia is no exception.

It is agreed by dental educators and practitioners alike that the scope of undergraduate orthodontic instruction has long needed to be broadened. Much disagreement exists, however, on questions of extent of and direction in which this expansion should be put into effect. The most radical differences in opinion are involved in the question of whether or not the undergraduate dental student should be given orthodontic cases to treat.

Proponents of this form of instruction grant that only simple cases should be treated by the undergraduate, the more difficult cases being relegated to graduate or postgraduate students; but, is it clear what constitutes the simple case? It must be admitted that there are cases which are easy to treat, but it is quite another matter to recognize them with any degree of certainty at

the time of diagnosis. To do so often taxes the diagnostic ability of the specialist. Simple cases of malocclusion are sometimes about as easy for the orthodontist to detect with certainty as are simple cases of meningitis for the internist.

There is at present no reliable basis on which to draw the line between simple and complex cases. Consequently no such line could be drawn by the general practitioner who has been inadequately trained, and the innocent public would suffer. Moreover, even if one were able unerringly to differentiate simple from complex cases, it is doubtful whether the inadequately trained man would always remain within the confines of a simple practice. Here again the public would pay.

Agitation to develop undergraduate instruction in orthodontic treatment is largely based upon health surveys made during recent depression years. The report that only 3 per cent of the necessary orthodontic service is being rendered has given rise to the thought that the situation can be remedied by graduating men with more undergraduate training in orthodontic treatment, even though such training be inadequate.

As a matter of fact no one presumes to advocate that each undergraduate treat more than three cases while in school. What a menace to the public the dental school would be if each student were required to do only three inlays, three amalgam fillings, three extractions, or three dentures! Can the situation among the indigent and semi-indigent classes be improved by supplying service of doubtful value? On the contrary, orthodontia must assume quite a different obligation in the training of general practitioners; it must be one of education along lines of growth and development and factors concerned therewith. Knowledge of this kind enters into operative procedures in every field of dentistry. Development does not cease with the young adult. From infancy to old age facial, occlusal, and dental development all obey the law of continuous change.

Remote causes of malocclusion are notoriously unknown. Prevention along broad lines, therefore, is at present impossible in this field. By far the majority of cases of malocclusion where treatment is attempted by orthodontists is, however, dependent upon less remote factors which could have been diverted. Certainly a large percentage of cases of malocclusion, the treatment of which enters into the field of health service, is preventable. General practitioners have been seeing these patients, but they have not practiced prevention because orthodontic curricula have not included the teaching of prevention. We shall never reach the masses with adequate orthodontic service except through prevention.

Our errors in the immediate past have consisted in the omission of adequate instruction on both etiology and prevention. The student must have thorough fundamental training in occlusion, classification, and all phases of growth and development, which will equip him as a practicing dentist to supervise intelligently and to watch the dentofacial development of his patients. Such training will enhance his ability to diagnose dentofacial deformities or prevent their occurrence.

For the present, treatment of cases for instructional purposes should be left to graduate and postgraduate students who can devote their attention for many months to this field alone.

George R. Moore.

Who Is an Orthodontist?

Under the above heading a correspondent writes as follows: "This question is one that I believe will demand a settlement before very long; in fact, it is one which to my way of thinking should have been settled ere this. When there were no sources from which to acquire special training, there may have been legitimate excuse for those who held themselves out as orthodontists; they were students in their own right. But now why should it be possible for Tom, Dick, or Harry, with no qualification beyond the desire to be a 'specialist,' to inflict himself upon the none too discriminating public?"

No doubt such information as contained in an article in *Oral Hygiene* has led many to undertake treatment of orthodontic cases. Edwin J. Blass in an article entitled "The Revival of Dentistry" in the October, 1933, issue of *Oral Hygiene* has the following to say: "Orthodontia, if for no other reason save monetary considerations, is one method of correcting a financially distressed dental practice. Competition is not so keen as in the ordinary dental practice, and the alluring ads of the advertising offices will never attract the children for orthodontic correction."

Such information is not new. As long ago as 1911 (twenty-four years ago) a book entitled *The Practical Orthodontist* written by A. G. Meier, had the following to say: "DON'T ENVY THE INCOME OF AN ORTHODONTIST; BE ONE. Realize that the public likes specialists. This means that your business card should be reprinted at once, also your letterheads, billheads, etc. The day that you decide to do Orthodontia have printed in the corner of your card, 'Orthodontia, Wednesday afternoon and Saturday,' and let these two days be known as the days on which you will discuss orthodontia subjects. Talk orthodontia to all your patients; give them all your new card; show them models that you may have or that you are making. It is a new, live subject and every one is interested in hearing of it and will tell their friends."

During times of financial stress when many otherwise busy dentists have time on their hands, such information as contained in these articles as well as short courses of instruction, with promise of increased income, is likely to lure men to attempt treatment of cases which would challenge the talents of those of long experience. This can terminate in only one way—failure. This lowers the status of orthodontia in the eyes of the patient and is damaging to the profession and dishonest to the public.

No doubt most readers of the INTERNATIONAL JOURNAL OF ORTHODONTIA AND DENTISTRY FOR CHILDREN have a well-formed idea of "Who is an orthodontist?" They may think an orthodontist is one who takes a keen interest in

his profession, in the American Society of Orthodontists, in the local orthodontic society, in the activites of the American Board of Orthodontia, one who studies and applies himself to the betterment of his calling; in other words, one who loves his work. We should like to know what *you* think.

The Forum will greatly appreciate your discussion.

W. R. H.

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Editorial

The New York Meeting of the American Society of Orthodontists for 1935

THE meeting of the American Society of Orthodontists which will be held at the Waldorf-Astoria Hotel, April 30, May 1, 2, and 3, will be one of the outstanding meetings of this organization for several reasons:

First, the last meeting of the American Society of Orthodontists was held in Oklahoma City in November, 1933, one and one-half years ago.

Second, the reorganization plan has been correlated and is ready for discussion and acceptance.

Third, the redistricting of the various sections throughout the United States has been finally completed after a great deal of work and difficulty.

Fourth, the Officers and Committees have put an unusual amount of driving power into this meeting to put it over with a "bang."

Fifth, the meeting will be held in what is believed by many to be the finest hotel in the world, a hotel without a peer in service, convenience and luxury. At the same time, the New York committee has been able to secure these accommodations at lesser rates for this convention than would be paid at many other first-class hotels in large cities throughout the country.

Elsewhere in this issue of the Journal will be found a map, showing the seven districts of the United States and Canada, which has been finally accepted by the various regional societies for the reorganization of the American Society of Orthodontists. President Leuman M. Waugh introduced a resolution at the Oklahoma meeting, which explains in a few words the inspiration for the reorganization plan:

"*Resolved:* That the President be empowered to appoint a committee on reorganization of the American Society of Orthodontists whose duty it shall be to inform the generally recognized sectional or regional societies and obtain their majority opinion of the proposal, and to prepare a plan for national reorganization to be presented for discussion and vote at our next annual meeting."

A joint committee was subsequently appointed by the President.

The proposal has been presented to the respective regional societies, and their reports are included elsewhere in this Journal. Readers of the Journal and particularly members of the American Society of Orthodontists are urged to read carefully the description, organization, and entire plan which has been carefully worked out and is in process of perfection by Dr. Waugh and his committees. Orthodontists are looking forward to the meeting in New York because they know there will be an informative, up-to-date, carefully worked out program correlated by an energetic program committee. Every consideration has been given the transportation problem for the benefit and convenience of all members, particularly those on the Pacific Coast. The New York committees advise that the meeting is even at this time assured of an attendance so large that the certificate plan of excursion rates will be enjoyed, and each visitor to the meeting is urged to secure his railroad certificate regardless of distance traveled so that he may take advantage of the benefit of the reduced rates accorded thereby.

Make plans now to attend this meeting. The New York members are putting much effort behind this meeting. Nonmembers may secure programs by writing Claude R. Wood, Secretary, Medical Arts Bldg., Knoxville, Tenn.

H. C. P.

Book Review

Histopathology of the Teeth and Their Surrounding Structures

Histopathology of the Teeth and Their Surrounding Structures by Rudolf Kronfeld, M.D., Professor of Special Histopathology, Director of Department of Research, Chicago College of Dental Surgery, Dental Department of Loyola University, Chicago, Illinois; Former Assistant at the Dental Institute of the University of Vienna, Austria. Published by Lea & Febiger, Philadelphia. Illustrated with 385 engravings.

In this book the following subjects are covered: histology and physiology of the dental tissues; regressive changes in pulp and dentin; dental caries; inflammation of the pulp (pulpitis); acute inflammation of the apical periodontal tissues (acute periodontitis); chronic inflammation of the apical periodontal tissues (chronic periodontitis); tissue changes following root canal therapy; biology of cementum; root resorption; epithelial attachment and gingival crevice; diseases of the periodontal tissues (gingivitis, pyorrhea); influence of function upon teeth and surrounding structures; pathologic changes due to excessive functional stress; tissue changes in orthodontia; impacted teeth, dentigerous cysts, median anterior maxillary cysts; fractures of teeth; enamel hypoplasia; histology of edentulous jaws; remarks concerning histologic technic.

There are included in the book a great many new facts of fundamental importance. The recent findings of dental research in microscopy are given comprehensively. This book goes farther than any previous observation which relied on the study of specimens from sheep, dogs, and other animals; it illustrates by means of specimens from human beings the actual tissue changes that correspond to certain well-defined clinical conditions. Emphasis is placed on problems which are new to the profession, and they are considered in detail. All illustrations except the diagrams are photomicrographs, which the author prefers to drawings because of their objectivity. Most of the specimens are of human origin.

This book is equally valuable as a textbook for students and as a reference work for practitioners. It is a highly scientific work, an important volume for any dental library.

News and Notes

American Society of Orthodontists

The thirty-third annual meeting of the American Society of Orthodontists will be held in New York, April 30, May 1-3, at the Waldorf-Astoria Hotel. Members of the dental and medical professions are invited to attend.

L. M. WAUGH, President,
576 Fifth Avenue,
New York, N. Y.

CLAUDE R. WOOD, Sec'y-Treas.,
Medical Arts Bldg.,
Knoxville, Tenn.

The American Board of Orthodontia

Created by the American Society of Orthodontists, 1929. Incorporated, January, 1930, State of Illinois, U. S. A.

A meeting of the American Board of Orthodontia will be held at the Waldorf-Astoria Hotel, New York, on April 29.

Those orthodontists who desire to qualify for a certificate from the Board should secure the necessary application form from the secretary. The application must be returned to the secretary, together with any other required credentials, at least sixty days prior to date of examination. In order to expedite the examinations the secretary will designate the hour at which the applicant may appear before the Board. Applications filed at the time of Board meeting will have preliminary consideration, so that applicant may be advised of work required for his subsequent examination.

Attention is called to the following resolutions adopted by the Board:

Any person desiring to make application to the Board for a certificate shall have been in the exclusive practice of orthodontia for a period of not less than five years or an equivalent to be determined by the Board and based upon the following conditions:

First. An instructor in orthodontia in a school satisfactory to the Board.

Second. An associate in the office of an orthodontist whose standing is satisfactory to the Board.

It is, however, to be understood definitely that any person at the time of making application for a certificate shall be in the exclusive practice of orthodontia in his own name.

A luncheon or dinner meeting of those orthodontists who have received the certificate of the American Board of Orthodontia will be held some time during the meeting of the American Society of Orthodontists. Members will be notified of the time and place.

ALBERT H. KETCHAM, President,
Republic Building,
Denver, Colorado.

OREN A. OLIVER, Secretary,
Medical Arts Building,
Nashville, Tennessee.

Scientific Exhibits for American Society of Orthodontists
April 30 to May 3, 1935
New York City

During the meeting of the American Society of Orthodontists, April 30 to May 3, inclusive, at the Waldorf-Astoria, New York, the officers in charge of the Scientific Exhibition desire to stage all this material in the beautiful Astor Gallery.

This spacious hall presents unsurpassed facilities for this part of the program, and the committee will be pleased to receive from you any material relating to orthodontia, which, in your opinion, would be of interest to our members.

The following is a partial list of materials which have already been submitted:

A large collection of stainless steel appliances, imported from abroad.
Model orthodontic office set-up in real modern effect.
Growth and development of teeth and dental arches (casts and charts).
Photographs of faces before and after treatment.
System of office records and stock letters relating to contracts with patients.
Radiographs of temporomaxillary articulation (original technic).
Slides relating to many phases of the specialty.
Collection of antique orthodontic appliances, books, and instruments.
Collection of unusual measuring instruments for spring force, band adapters, soldering appliances, spot-welding instruments, pliers, etc.
Facial casts, with dental inserts, showing relationship of same.
Facial casts illustrating many problems of habit.
Double resection of mandible for correction of malocclusion.
Ascent of man—American Museum of National History—Dr. Gregory.
Models and photographs showing the surgical as well as the prosthetic treatment of deformities of the jaws and face.
Dr. Alex Herdlicka, Washington, D. C.—Normal variations of the human skulls—of interest to the orthodontist. (This exhibit will supplement his essay.)
Collection of stainless steel appliances and methods of construction.
Harvard University Dental School, exhibit of

1. Undergraduate Department of Orthodontics.
2. Postgraduate Department of Orthodontics.
3. Orthodontic Research.

Entire apparatus used by the Bolton Study Committee and results of their studies, including a portion of animated motion pictures. (Dr. Broadbent's photo of set-up very good.)
Exhibit from the Forsyth Dental Infirmary for Children, which will be used for clinic purposes on Friday, in the general clinic room.
Blumenthal ligature holder and Blumenthal pliers.

Please communicate with C. A. Spahn, chairman of the Scientific Exhibits Committee, 654 Madison Avenue, New York, N. Y., describing concisely any material that you may have which would fit into this entertaining and instructive part of the program.

Excellent care will be given to all articles received, and they will be returned to you, prepaid, after the meeting.

Asociacion Mexicana de Ortodoncia

During the year 1934 there was organized in Mexico City, D. F., a society of orthodontists composed of those who are interested in the study of the science and art of orthodontia. The name of the society is Asociacion Mexicana de Ortodoncia. The secretary-treasurer is Dr. S. Fastlicht. The charter members are: Roberto Avila, Caso Francisco Calderon, Mercado Miguel Diaz, Samuel Fastlicht, Rafael Ferriz, Alberto Fisch, Ralph Horn, Jose Luis Legarreta, Carlos M. Paz, Jose J. Rojo.

New York Society of Orthodontists

The fourteenth annual meeting of the New York Society of Orthodontists will be held in conjunction with the meeting of the American Society of Orthodontists at the Waldorf-Astoria Hotel, New York, April 30 to May 3.

A business session for the election of officers, etc., will be held Thursday, May 2, at a luncheon.

FREDERIC T. MURLLESS, JR., President,
43 Farmington Ave.,
Hartford, Conn.

FRANKLIN A. SQUIRES, Secretary-Treasurer,
Medical Centre,
White Plains, N. Y.

Report of the Meeting of the Great Lakes Association of Orthodontists

The ninth annual meeting of the Great Lakes Association of Orthodontists was held January 28 and 29, at Hotel Statler, Detroit. The following program was given.

"President's Address," by Oliver W. White, Detroit. "An Analysis of Some of the Recent Studies of the Cause of Dental Caries," by Phillip Jay, M.S., D.D.S., Research Associate, School of Dentistry, University of Michigan. "The Reorganization of the American Society of Orthodontists on a National Basis," by L. M. Waugh, D.D.S., F.A.C.D., New York. "Vitamins, Calcium and Phosphorus," the relation of these factors to the growth of bones and teeth, by A. D. Emmett, M.A., Ph.D. "The Pituitary Gland," a brief survey from the biochemical and physiological aspects, by Oliver Kamm, M.S., Ph.D. "Pituitary Growth Hormone," the effect of pituitary extracts on body growth, by D. A. McGinty, M.S., Ph.D. "The Present and Future Economic Trends in Orthodontics," by L. M. Waugh, D.D.S., F.A.C.D., New York. "Orthodontic Treatment," by Andrew F. Jackson, D.D.S., Philadelphia. "Some Facts and Observations Related to the Soldering of Chrome Alloys," by C. J. Vosmik, D.D.S., and P. B. Taylor, M.A., Cleveland. "A Cine Presentation of the Technic Involved in Starting an Orthodontic Case," by I. F. Steuer, D.D.S., Cleveland.

The following clinics were given (Frank M. Casto, chairman): "Orthodontic Treatment," by A. F. Jackson, Philadelphia. "A Stainless Steel Lingual Arch," by Edward Martinek, Detroit. "Appliance to Correct Thumb Sucking," by J. D. Locke, Grand Rapids, Mich. "Orthodontia Without Bands," by Holly Halderson, Toronto. "The Use of Coiled Springs With Labial Arch for the Posterior Tipping of the Molars," by A. A. Somerville, Toronto. "A Flexible and Adjustable Basket Type Clasp of Simple Construction," by Barnett Malbin, Detroit. "One Piece Stainless Steel Arches With Auxiliary Springs," by Murray L. Simon, Toronto. "Soldering of Chrome Alloys," by Douglas J. Jamieson, Ann Arbor. "Appliances in Chrome Alloy," by Harold J. McCaughrin, Ann Arbor. "Application of a New Spring Gauge to Appliance Design," by George R. Moore, Ann Arbor.

At the business session Dr. C. J. Vosmik of Cleveland gave the report of the Board of Censors; Dr. R. P. Howarth of Cleveland gave the report of the secretary-treasurer.

The annual dinner was held Monday evening, January 28, at the Hotel Statler.

Thomas P. Hinman Midwinter Clinic

The Thomas P. Hinman Midwinter Clinic will hold its annual meeting March 18 and 19 at the Biltmore Hotel, Atlanta, Ga.

JOSEPH D. OSBORNE, Sec'y-Treas.,
Doctors Building,
Atlanta, Ga.

Dental Society of the State of New York

The Society will hold its Sixty-Seventh Annual Meeting June 12-15, 1935, at Saranac Inn, Upper Saranac, N. Y.

A cordial invitation is extended to all ethical dentists to attend the sessions.

Dr. Augustave Neuber, President
619 Union Street,
Schenectady, N. Y.

Dr. A. P. Burkhart, Secretary
57 E. Genesee Street,
Auburn, N. Y.

European Orthodontic Society

The European Orthodontic Society will hold its meeting at the Langham Hotel, London, W. 1, on July 29 and 30, 1935, with Dr. Sheldon Friel as its President. Many eminent European orthodontists have signified their intention of being present and reading papers or giving clinics and demonstrations. They look forward to a very interesting meeting, as there is a marked and growing desire to acquire knowledge of this fascinating subject.

The meeting will be immediately followed by the annual meeting of the American Dental Society of Europe, and it is expected the attendance will be a large one. Doubtless, when the final arrangements are made, there will be an exchange of hospitalities between the two societies, which was the arrangement of the last meeting at Scheveningen, The Hague, in May, 1934.

The European Orthodontic Society, by invitation from the Secretary, Mr. G. F. Cale-Matthews, is very eager that co-patriots of America attend this meeting and contribute to the program.

The officers of the European Orthodontic Society at the present time are as follows: President, E. Sheldon Friel, Dublin; Vice President, H. E. March, Bexhill, England; Secretary, G. F. Cale-Matthews, London; Editor and Treasurer, O. Henry, London. Board of Censors: J. T. Quintero, Lyon; F. Stuhl, Paris; E. D. Barrows, London.

Southern Society of Orthodontists

The fourteenth annual meeting of the Southern Society of Orthodontists will be held at the Signal Mountain Hotel, Chattanooga, Tenn., on September 30, October 1 and 2.

Members of the dental and medical professions are cordially invited.

Winston P. Caine, President,
Medical Arts Building,
Chattanooga, Tenn.

William P. Wood, Jr., Secretary,
442 W. Lafayette Street,
Tampa, Florida.